# ELECTRICAL REVIEW

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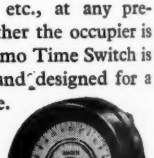

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ELECTRICAL REVIEW

Vol. CXLVI No. 3784 2ND JUNE, 1950

THE OLDEST ELECTRICAL PAPER • ESTABLISHED 1872

# Installation Industry

## HARMONY BETWEEN PUBLIC AND PRIVATE ENTERPRISE

THE Electrical Contractors' Association held its first post-war conference at Folkestone last year in an atmosphere of doubt and uncertainty—doubt of the future, with intensified competition from the nationalized electricity supply industry, and uncertainty whether defence or defiance was the correct attitude.

Since then an endeavour has been made to arrive at an amicable working arrangement between the contractors and the Electricity Boards and in consequence there appeared to be more confidence and less bitterness at last week's Hastings conference. The new note was sounded in the presidential address. Mr. Dickinson testified to the good relationship now existing between the Electricity Board chairmen and the E.C.A. Area Committees which had been set up. Regular meetings, he said, were doing much to foster the goodwill visualized in the national negotiations which had resulted in the summary of agreed principles.

### B.E.A. Goodwill

On the B.E.A. side the participation of the Authority's chairman in the conference was a valued token of good intent. None of those contractors who were thus enabled to meet Lord Citrine could be left in any doubt of his sincerity of purpose and his determination to secure the best service to the consumer from an industry of which he has intimate personal knowledge. Contractors will look to him to influence the Electricity Boards to share his view that it is possible for both contractors and Boards to live and work side by side.

It must not, however, be thought that the pact will operate automatically. Consultation between the Boards and the E.C.A. committees must be continuous. One subject which the contractors are already pursuing is that of the allocation of overhead charges in the accounts of the Boards' installation departments. This is no doubt what Mr. Dickinson meant when he said in his address that the B.E.A. accounts for its first year of operation were under review and that the E.C.A. would shortly approach the Authority for an opportunity of discussing "certain features."

### Down to the Districts

This is a point for settlement at the higher levels but it is not only there that matters must be discussed. Agreement on general principles is a very good thing but there must be a descent from the general to the particular. It is the individual contractor who faces the day-to-day problems for which there can be no general solution.

Even Sub-Area organization will be too wide to deal with these problems. The aim must be to get the Boards' District managements into close touch with local contractors so that the many minor troubles which will inevitably arise shall be handled in an understanding way. In

their branches members of the E.C.A. are accustomed to meeting business rivals on a friendly footing. The Boards' local installation departments should be regarded in the same light. But they must operate on equal terms: there must be no suspicion that the Boards' contracting work is subsidized from electricity revenue. Even under to-day's restricted conditions there is work for both kinds of contractors. When the electrical industry is free to resume its normal expansion they will find it difficult to keep up with the demand.

## ETHICS AND EXPORT

Much of the influence exercised by consulting engineers in promoting export is of the invisible kind. It is not one wit the less important for that. Great as is the value of their overseas contracts, their high code of ethics is of quite equal merit as a National asset. That their prestige stands so high abroad, with consequent acceptability of their specifications, indicates the advantages of the code from a more materialistic viewpoint. Nevertheless, as Mr. Harold Wilson and Sir Cecil Weir urged at the annual dinner of the Association of Consulting Engineers (reported on another page) an intimate knowledge of local conditions is also necessary. Mr. T. A. L. Paton, their president, showed how much was already being done through personal visits and co-operative representation.

## UNIFORM CHARGES

Alderman W. J. Bennett, chairman of the Eastern Electricity Consultative Council, writing to the *East Anglian Daily Times*, calls for the equalization of charges to rural and urban consumers. He has a good case, of course, and his sentiments will be appreciated in the predominantly rural Eastern Area. But urban consumers in that Area could not possibly bear the burden alone and so the equalization of charges in different Areas becomes necessary. Ald. Bennett thinks the B.E.A. might assist by scrapping its complicated formula for bulk supply tariffs, consolidating its generating costs and overheads and expressing the price in a "simple pence per unit cost" to the Area Boards. The B.E.A. has already abolished the "differentials" in m.d. charges which were largely artificial; it is now asked to examine the running charges which are varied by coal clauses. One point which the Alderman makes is that although 60 per cent of the Eastern Board's supply is "imported" from another Area, it has to pay on the higher Eastern Area basis.

## UNION ACTIVITIES

In his address to the electrical contractors at Hastings, Lord Citrine replied vigorously to remarks made by the general president of the Electrical Trades Union the previous week. Mr. Foulkes, referring to Lord Citrine's membership of the Union, wondered whether it embarrassed him or the union most. Lord Citrine has been a member of the E.T.U. for 39 years and as a full-time official helped to build it up; naturally he refuses to be persuaded to leave now. He said that he would not be embarrassed if the union kept to its legitimate activities and ceased to lend itself to subversive political propaganda. We believe that many other members, generally the less vocal ones, share this view.

## FACING FACTS

At last week's annual meeting of Johnson & Phillips, Ltd., the chairman, Mr. G. Leslie Wates, expressed the view that the company's production and profits had passed the peak and that export trade was becoming more competitive. There is no doubt that the war-retarded demand has now been largely satisfied and more normal conditions must be expected. That is not to say that a decline must set in, but it does mean that more active cultivation of business will be necessary to maintain the steady upward movement that the war interrupted. It is not pessimistic to face and acknowledge facts; it is an essential prelude to measures designed to meet the situation.

**Readers will note a slight reduction in the number of pages in this issue of *Electrical Review*. This reduction has been necessitated by the withdrawal of overtime working by a section of the printing industry and has, in the circumstances, been unavoidable. We hope that it will be only temporary.**

# Contractors at Hastings

## *Second Post-War Conference*

ALTHOUGH the weather was unpropitious for the earlier part of last week's conference of the Electrical Contractors' Association at Hastings, an improvement set in on Thursday and lasted for the rest of the period.

At his reception on the Wednesday evening the president, Mr. S. Dickinson, Associate I.E.E., was accompanied by Mrs. P. G. Wallis in the absence of Mrs. Dickinson on account of illness. Most of the 540 delegates and visitors were present and the dance floor of the Queen's Hotel ballroom was crowded.

The business session of the conference began on Thursday morning with the customary civic welcome. The Mayor (Councillor J. D. Cooper), in the course of his remarks, referred to the previous Hastings conference in 1938. After Mr. Dickinson had expressed the Association's thanks, Mr. L. C. Penwill, director and secretary, secured the meeting's unanimous approval that flowers and a telegram should be sent to Mrs. Dickinson.

### Address and Paper

The presidential address, dealt with in our last issue, followed, and after an interval for coffee Mr. S. L. M. Barlow read his paper on "The Trend in the Development of New Techniques in Electrical Installations (also reviewed in last week's issue). He illustrated the paper by means of lantern slides showing good examples of modern installations.

The ensuing discussion was opened by Mr. M. E. Broadbent (Huddersfield), who said that Mr. Barlow's paper had great practical value for the average electrical contractor. He went on to say that too few contractors appreciated the desirability of becoming corporate members of the Institution of Electrical Engineers. The speaker asked for information on graphic estimating and costing methods and wanted to know if there were mechanized accounting systems suitable for the small contractor. He thought that underfloor heating was ideally suitable for development by E.C.A. members.

Mr. Penwill intervened in the discussion to suggest that contributions from manufacturers would be especially welcomed.

### Fluorescent Lighting Control

Upon the resumption of business in the afternoon, Mr. R. F. Longley (Thornton Heath) said that several kinds of trouble developed in fluorescent lighting installations during installation and the first few weeks of operation. Manufacturers should welcome the experience of contractors in this connection and help to relieve them of the high maintenance costs sometimes incurred. He deprecated the abolition by the Electric Light Fittings Association of tapped chokes for fluorescent lighting installations, which meant that contractors had to carry a range of chokes for different voltages.

Mr. A. F. Plummer (Luton) asked whether aluminium-alloy conduit was not better than steel for aluminium prefabricated buildings. He also wanted to know whether the burying of aluminium conduit in concrete floors was satisfactory and whether the higher thermal conductivity of aluminium was an advantage.

Mr. E. A. Reynolds (Birmingham) said that micro-gap switches merited greater use. Dr. W. M. Thornton had shown in an I.E.E. paper before the war that a short break was the best way of rupturing an a.c. circuit to avoid the maintenance of an arc. Development had been held up by the war but great progress had since been made with switches for from 5 to 40 A. H.r.c. fuses would break very large short-circuit currents without damage, but they were no protection against overload and should therefore be used only for the protection of the whole of an installation. Mr. Reynolds commended the work of the E.D.A.-B.S.I. Testing House, which was proving of great benefit to the industry. Aluminium conduit was the subject of long-term research and preliminary re-

ports indicated that there was practically no electrolytic corrosive action between it and iron.

Mr. A. Brammer (secretary, Association of Supervising Electrical Engineers), speaking of compulsory registration of contractors, said that the National Committee, formed under the auspices of the A.S.E.E., had secured much publicity for the subject. He agreed that wages and salaries should be the same in both public and private branches of electrical contracting. The electrical contractor who had come up against all the problems encountered in installation work was a great asset to the electrical industry. Many qualities were necessary in a supervising electrical engineer and in this connection he mentioned the value of the Swann Diploma of the A.S.E.E.

Mr. E. B. Sawyer (manager, Lighting Service Bureau) considered it an exaggeration to say that there was still much criticism of fluorescent lighting. Millions of the lamps had been installed and generally criticism arose from faults in installation. There was no justification for suggesting that the lighting was responsible for eyesight trouble and the stroboscopic effect was negligible. Fluorescent lighting had great scope as a supplement to, or substitute for, daylight. He thought that eventually the only acceptable artificial lighting would be that in which the sources were not seen. The user should be able to get expert advice from the contractor.

## Lack of Co-operation

Mr. H. F. Truman (Walsall) complained of the frequent complete lack of co-operation from architects in the planning of electrical installations before buildings were put up. He mentioned a case where no accommodation for conduits had been allowed for in the floor of a building and the architect had been persuaded to put in a false ceiling after erection. Mechanization could be overdone, but some equipment would soon pay for itself by the labour it saved.

Mr. P. G. Wallis (vice-president) suggested that manufacturers of conduit and conduit fittings should make an effort to ensure that the threads in fittings were straight. He said that there was little scope for power-driven machines on small installations. There was a great need for the revision of screw-cutting methods. He wanted to know whether there was a satisfactory power-driven wall-chasing tool.

Mr. A. Redvers Pratt (Bradford), who was prevented by illness from attending the conference, sent a contribution (read by Mr. Penwill) in which he backed the call for greater co-operation between the I.E.E. and E.C.A. He would have liked the author to say something about consumers' equipment.

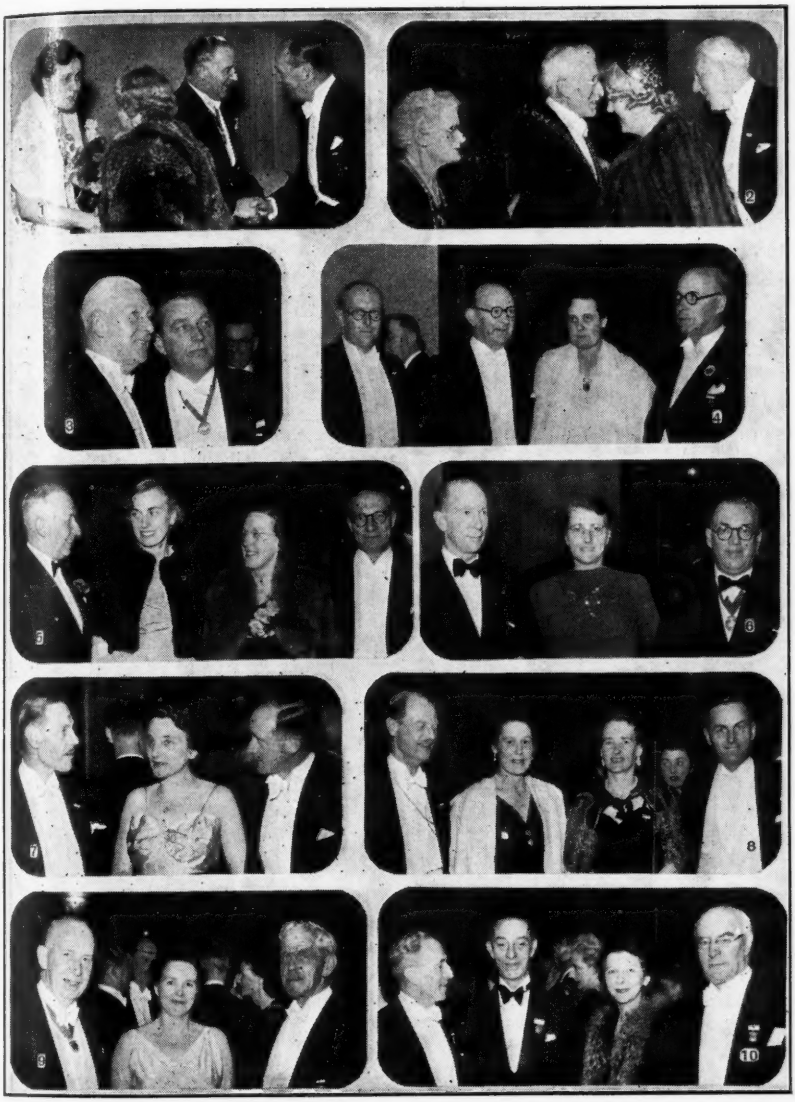
## Mineral-insulated Cable

Mr. C. J. Veness (London) said that he would have liked to have seen something about the use of mineral-insulated copper cable in chemical works and similar places and buried direct in the ground. He thought the overhead grid system made it difficult to install additional equipment. Mr. Barlow might have included something on machine tool control equipment.

Mr. V. Ferens (Sunderland) said that the Newcastle Branch had recommended the E.C.A. Council that "as fitted" drawings should be the responsibility of the consultants. Small contractors could not afford to set up drawing offices.

Replying to the points raised by speakers, Mr. Barlow agreed that E.C.A. members should take greater interest in I.E.E. activities. He thought that graphic methods of costing were generally satisfactory only for repetition work. H.r.c. fuses were suitable, of course, for the main protection of installations, especially when nowadays there was generally a substation nearby. Manufacturers could learn much from contractors in the design of fluorescent lighting control gear. Aluminium conduits were naturally ideal for aluminium buildings. As regarded their use in concrete floors, there were possibly harmful constituents in cement but so far there had been insufficient experience. He thought that their higher thermal conductivity was advantageous. Intensive research was proceeding which should extend the use of aluminium conduit.

Mr. Barlow agreed with Mr. Sawyer that to-day's high intensities were causing a trend towards indirect lighting. The fluorescent lamp was undoubtedly a first-



1. Mrs. P. G. Wallis and the President (Mr. S. Dickinson) receiving Mr. and Mrs. J. G. Briggs. 2. The Mayor and Mayoress of Hastings greeting Lord and Lady Citrine. 3. Lord Citrine with Mr. Penwill. 4. Mr. R. V. Banks, Mr. J. James and Mr. and Mrs. P. G. Wallis. 5. Mr. and Mrs. A. Page and Mr. and Mrs. W. Lewis Smith. 6. Mr. and Mrs. T. Pitts and Mr. W. Womersley. 7. Mr. A. F. Plummer and Mr. and Mrs. G. F. Bedford. 8. Mr. and Mrs. R. H. M. Drake and Mr. and Mrs. M. R. H. Sadler. 9. Mr. and Mrs. S. N. Watkins with Mr. E. A. Reynolds. 10. Mr. H. F. Carpenter, Mr. J. H. Cosens, Mrs. Carpenter and Sir Montague Hughman.

class light source, but he did not think that it would replace the tungsten lamp. Collaboration with architects had proved difficult, but he thought it was coming. The small contractor could prepare simple drawings himself and thus make the job better and easier. "As fitted" drawings showed what the contractor had done, not what the consultant wanted him to do. He, too, would like conduit fittings makers to attend to the matter of threads; many fittings were having to be rejected because of inaccurate threading. Even small contractors could advantageously use power-driven tools. There were a number of good wall-chasing tools on the market, but they needed to be used with discretion.

In thanking Mr. Barlow, the president expressed his disappointment that more manufacturers' representatives had not spoken in the discussion.

During the day Lord Citrine, chairman of the British Electricity Authority, arrived with Lady Citrine and they were present at the Mayor's reception at the White Rock Pavilion in the evening.

On Friday morning the members went into closed session for the annual general meeting and after the somewhat prolonged proceedings and a short interval the whole conference assembled for the closing of the business sessions. Mr. Dickinson introduced his successor as president, Mr. P. G. Wallis (Maidstone), in felicitous terms, referring to his two years as vice-president and wishing him success.

Mr. Wallis, in acknowledging the honour which members had done him, expressed the view that the Association while (according to its motto) it pursued peaceful methods should be very strong in action.

The president then thanked all who had helped to make the conference a success, particularly the Mayor and Corporation and their officials and Mr. V. R. Turner, chairman of the local branch, and his stewards.

## Lord Citrine's Address

After the Mayor had replied to the president's remarks, Lord Citrine was asked to speak. He said that he started as an apprentice in the contracting industry and remained in it until he was 28, when he became a full-time official of the Electrical Trades Union, of which he was still a member. Recently public reference had been made to this by the general president of the E.T.U. who had said that he did not know to whom his membership was the more embarrassing—the Union or Lord Citrine himself.

Lord Citrine gave an assurance that it was no embarrassment to him to belong to the Union so long as it confined itself to legitimate trade union activities. He would not be so happy if it lent itself to subversive propaganda, whether from Moscow, London or anywhere else. He would always do his best to support the trade union movement and properly organized associations of employers. If negotiations were to be free from State interference there must be good organization on both sides. The whole structure was placed in jeopardy when individuals broke agreements arrived at on their behalf.

## Fair Competition

As chairman of the B.E.A. he was trying to secure fair competition. He had told Mr. Penwill long before vesting day that there would be no change of policy unless and until there had been adequate discussion with the Association.

An agreement had been reached and if it were properly implemented and carried out with common sense and toleration it would establish the contracting industry in a stronger position than ever. The interests of E.C.A. members and employees and the B.E.A. lay in providing the best possible service to consumers in co-operation and while he was chairman that would be the policy.

After a reference to the forthcoming British Electrical Power Convention, Lord Citrine concluded by saying that he was satisfied that the advent of the B.E.A., far from menacing the broad interests which the Association represented, had in no small measure consolidated and developed them to the advantage of the community.

In the afternoon coaches took the delegates to the Crowhurst Park Hotel and Country Club where a garden party was held in pleasant surroundings. The conference concluded with a smoking concert in the Queen's Hotel in the evening.

Speakers at last Thursday's session: 1. Mr. S. L. M. Barlow (author of the paper). 2. Mr. A. F. Plummer. 3. Mr. L. C. Penwill (director). 4. Mr. S. Dickinson (president). 5. Mr. E. A. Reynolds. 6. Mr. P. G. Wallis (president-elect). 7. Mr. A. Brammer. 8. Mr. R. F. Longley. 9. Mr. E. B. Sawyer. 10. Mr. V. Ferens. 11. Mr. C. J. Veness. 12. Mr. H. F. Truman.

# CORRESPONDENCE

**Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents**

## Power Plant for Sydney

THE Sydney County Council, which I represent on engineering matters in Europe, has recently sent the undertaking's electricity sales superintendent (Mr. W. Riley) to London to contact and act as an adviser to firms desiring information regarding the power supply position for industry and commerce in the Sydney Metropolitan areas.

Mr. Riley is desirous of pointing out to any manufacturers who may be considering extending their interests in or to New South Wales, that the Sydney County Council is already in the process of installing an additional 250,000 kW of generating plant at the Pyrmont "B" and Bunnerong "B" power stations and is, at the moment, placing contracts for the first sections of a new 300,000 kW power plant at Lugarno, 15 miles south of Sydney. Other generating authorities in the State of New South Wales are also extending their power plants at the present time. It is expected that the present shortage of electricity at peak periods will be overcome by 1952, if not sooner.

Mr. Riley will be available through this office (32, Victoria Street (1st Floor), London S.W.1.) during the next four months or so.

JAMES F. MAGEE,
*Engineer Representative,*
Sydney County Council Electricity
*London, S.W.1.* Undertaking.

## Service Qualifications

DURING the war I spent four years as an electrical engineer officer in the R.A.F., following a period of two years as an electrician in the Service. I was therefore very interested to read the remarks of Mr. Milne (5th May issue) regarding the value of Service qualifications in civilian life, with which I feel I must disagree. Having passed through a period of training as an electrician and subsequently being in charge of a number of tradesmen, I can view this problem from a number of angles.

I do feel that the training given in the Service is very good, as it covers many branches of the trade with a thoroughness that cannot be given elsewhere. How many apprentices in civilian life are taught, by qualified instructors, to apply the correct methods? Very few, I think.

The training given to potential tradesmen in the Service is broken down into a number of stages which include the following: The correct handling of tools; stripping wire and soldering, etc.; accumulators; d.c. and a.c. machines; wiring; maintenance of mechanical and electrical equipment; and many others, including mechanical transport electrical equipment. The practical and theoretical training for each subject are received simultaneously, which is an important point. Instruction is given with the aid of sectioned models designed for this purpose. Although before joining the R.A.F. I had served four years of my apprenticeship and sat the National Certificate examination, I learned quite a lot from this planned training.

Very often the ex-Service electrician is referred to as a "24-volt electrician," but when one considers that his duties include the maintenance and installation of synthetic ground trainers, mobile generating equipment, airfield lighting, and mechanical transport electrical equipment (which is a trade in itself), it is rather a different story.

I know several Service-trained men who have proved themselves capable tradesmen in civilian life, and I think the question can be summed up by saying that a normally intelligent person who gets down to his training in the Service need have no fear of tackling the job in civilian life.

E. H. D.

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**Swedish Plant Capacity.**—Sweden's power stations at the end of 1949 had an aggregate capacity of 3,010 MW. More than 1,500 MW is now in the course of construction. The largest project is the 290 MW Harspranget station the first unit of which will be ready in 1951.

# PERSONAL and SOCIAL

## *News of Men and Women of the Industry*

THE general manager of the Light Group of Philips Electrical, Ltd., **Mr. A. G. van Welie,** has resigned his position on being appointed managing director of the Stella Lamp Co., Ltd. Following his resignation, **Mr. H. C. White** has been appointed commercial manager of the Philips' Light Group, and **Mr. R. P. Sayers,** F.I.E.S., has been appointed assistant commercial manager. Mr. White joined Philips as a lighting representative in Leeds twenty years ago, subsquently having charge of the company's Special Lamp Department at head office, and later managing the Manchester branch for ten years. Mr. Sayers was a Holophane lighting sales engineer until

Mr. H. C. White

Mr. R. P. Sayers]

1934, when he joined Philips to develop the applications and sales of discharge lamps and lighting, subsequently managing the company's Lighting Department, and sales of fluorescent, mercury and sodium lamps and lighting equipment.

Simon-Carves, Ltd., announce the appointment of **Mr. T. Moore,** M.Inst.F., to their Power Plant Department as assistant sales manager for the northern area of the British Isles. Mr. Moore was formerly engineer-in-charge of the Power Station Department of Davidson & Co., Ltd.

**Mr. C. A. Barker,** general sales manager of "Servis" all-electric washing machines, has been appointed a director of Wilkins & Mitchell, Ltd., Darlaston. **Mr. A. Thorley,** "Servis" divisional manager at Manchester, becomes general sales and maintenance manager, home trade. **Mr. G. Garth** leaves the "Servis" South African company to become divisional commercial manager at Manchester, while his place in South Africa is to be taken by **Mr. J. Lee,** divisonal maintenance manager at Wolverhampton.

**Mr. Charles Pinkham,** manager of the Publicity Organization of the General Electric Co., Ltd., is retiring on 30th June after serving for 37 years with the company. Mr. Pinkham was born in 1889 and was educated at the Leys School and Caius College, Cambridge, where he took his M.A. degree. During the course of his studies at Cambridge he found time to play Rugby and Association football and lacrosse sufficiently well to acquire a blue for each and to play "Soccer" for England against France.

Mr. Charles Pinkham

He joined the G.E.C. in 1913 and in 1920, on his return from the war, was appointed manager of the Stock Rooms. In 1924 he was transferred to the Order Department as manager, and in 1927 he was appointed manager of the Publicity Organization, in which capacity he has been responsible for the entire range of G.E.C. publicity. He has been a member of the Council of the Advertising Association for 14 years.

**Mr. R. G. W. Andrews,** who has been with Venner Time Switches, Ltd., for thirty years, has now been appointed production manager to the company. Mr. Andrews was apprenticed to Venner's in 1920, when the firm was in Earl Street, Westminster, and moved with them to Horseferry Road and thence to the new factory at New Malden. Working through each department in turn he was successively appointed chargehand, foreman and technical adviser to the production office. Later appointments included that of assembly

Mr. R. G. W. Andrews

superintendent and works superintendent, the last of which he has held since 1943. Other recent appointments by the company include **Mr. W. J. Ryan** as deputy production manager and **Mr. R. A. Abbott** as personnel manager. Mr. Ryan served previously with Thorn Electrical Industries, the Rootes Group and Wilmot-Breedon's. Mr. Abbott, an ex-squadron leader of Transport Command, was previously personnel and administrative manager to Skyways, Ltd.

**Mr. W. Newman** has been appointed sales manager to the Hepworth Iron Co., Ltd., of Hazlehead, Yorkshire. He was formerly sales manager to H. J. Baldwin & Co., Ltd.

The recent annual arts and crafts exhibition held by members of the staff of **W. T. Henley's Telegraph Works Co., Ltd.,** as in previous years, reached a very high standard. In the fine art section there were some excellent works in oils and black and white, while the photographic section contained some fine examples of work with the camera. The handicraft exhibits included skilful contributions in woodwork, embroidery, sewing, knitting and crochet. Miss W. Rigby judged the fine art exhibits, Mr. G. I. Smith the photographs, and Mr. G. Ashby, Mrs. Clayton and Mrs. Evans the handicrafts. The awards were presented to the winners by Sir Montague Hughman.

The Aluminium Wire and Cable Co., Ltd., announces that **Mr. W. J. Nicholls,** B.Sc., M.Inst.C.E., A.M.I.E.E., has joined the staff as assistant to the chief electrical engineer. Mr. Nicholls has been overhead lines design specialist at the headquarters of the British Electricity Authority. Earlier in his career, he served for five years with the Foundation Co. under Mr. J. L. Eve before joining the staff of Kennedy & Donkin. He was engaged in the grid construction in S.W. England and S. Wales, and in 1936 became assistant to Mr. J. A. Lee, construction engineer of the Central Electricity Board and later took up his appointment with the B.E.A.

**Mr. W. J. Nicholls**

The Sunco Association Football team **(Sun Electrical Co., Ltd.),** which finished as runners-up last year in the third division of the Westminster League, have run out clear winners this season. The presentation of the League trophy and medals was made by the Mayor of Westminster at Caxton Hall on 20th May.

**Mr. S. Dickinson, president of the E.C.A., with Manchester members at the Hastings Conference**

Long-service certificates have been presented to sixteen employees of the **B.E.A. North Western Division** who have retired since the formation of the Authority in 1948. The presentations were made on 25th May at British Electricity House, Wilmslow Road, East Didsbury, Manchester, by Mr. C. T. S. Arnett, Divisional Controller.

The amateur boxing section of the Telcon Social and Athletic Club **(Telegraph Construction & Maintenance Co., Ltd.)** held an inter-club tournament—the first of its kind—at Telcon Works, Greenwich, on 22nd May. An interesting programme of contests took place with the Royal Ordnance Factory Amateur Boxing Club. Mr. Len Harvey, the former boxing champion, presented the prizes, and the M.C. was Mr. B. Bradley. The large and appreciative audience included the president of the Club, Mr. F. Leighton (works manager), Mr. J. N. Dean (managing director), Mr. W. F. Randall (director) and Dr. E. W. Smith (director, Submarine Cables, Ltd.).

## OBITUARY

**Mr. F. G. Nesbitt.**—The death occurred on 24th May at Middlesex Hospital, at the age of fifty-eight, of Mr. Francis Grahame Nesbitt, a director and joint sales manager of the Simplex Electric Co., Ltd. Mr. Nesbitt was educated at St. Bede's, Eastbourne, George Watson's College, and Heriot Watt College, Edinburgh, and served an engineering apprenticeship with John Greig & Sons, engineers and iron founders, Edinburgh, with whom he later became a sales engineer. During the 1914-18 war he served in the Royal Engineers, and from 1920-22 was London manager of the electric cooking and heating department of the Carron Company. In the latter year he joined the Credenda Conduits Co. (afterwards merged in the Simplex Electric Co.), with whom he was successively manager of the London cooking and heating department and sales manager at Birmingham. He became joint sales manager of the Simplex Co. in 1932, and was appointed a director in 1937. Mr. Nesbitt was a Fellow of the Incorporated Sales Managers' Association, a member of the Illuminating Engineering Society and an associate member of the Association of Public Lighting Engineers. He was the first chairman of the B.E.A.M.A. Domestic Electric Cooker Section, and chairman of the Domestic Electrical Appliances Section. He was also chairman of the Electrical Exhibitors' Committee of the B.I.F., and of the Electric Water Heater Manufacturers' Association.

**The late Mr. F. G. Nesbitt**

**Mr. Bertram Silcock,** F.C.A., of Warrington, director of Revo Electric Co., Ltd., Birmingham, has died in a Colwyn Bay nursing home. He was sixty-eight.

## WILLS

**Sir Frederick C. Stewart,** chairman of the North British Locomotive Co., Kelvin & Hughes, Ltd., Kelvin Bottomley & Baird, Ltd., Thermotank, Ltd., and other companies, who died on 10th March, left personal estate in England and Scotland valued at £645,310.

**Mr. H. G. Shoolbred,** founder and at the time of his death a director of the Shoolbred Electrical Co., Ltd., who died on 28th September last, left £8,725 gross (£8,104 net).

## I.E.E. Supply Section Conversazione

FOR many past years the Supply Section of the Institution of Electrical Engineers has arranged an annual dinner or supper dance. This session it was decided to vary the form of this social occasion by having an evening conversazione which accordingly took place in the I.E.E. headquarters building on Wednesday of last week. The object was to enable more members and their ladies to take part, while it was hoped that the younger members of the Section would also find it possible to attend.

Members were received by Mr. J. W. Leach (chairman) and Mr. C. O. Boyce (past-chairman) in the library where buffet refreshments were served throughout the evening. Five cinema films were exhibited at intervals in the lecture theatre, while thirty-three electrical engineering exhibits were on view in the several ground-floor rooms, many of them working models, of considerable instructive value.

**"ELECTRICAL WHO'S WHO"**

**Brief biographies of about 2,600 leading men and women in all branches of the industry appear in the "Electrical Who's Who." This is now obtainable from the *Electrical Review*, Dorset House, Stamford Street, London, S.E.1, or from booksellers, price 12s. 6d. (postage 7d.)**

# VIEWS on the NEWS

## By REFLECTOR

AN effective advertisement issued by the South Eastern Electricity Board makes "a proposal . . . . to a man on his knees." He is, it suggests, "tired to death of tending the boiler, tired of messing with rake and shovel when the weather's warm and you don't want a fire at all." The solution, of course, is electric water heating. The only fly in the ointment is the present oppressive tax on this labour-saving equipment. The Chancellor of the Exchequer, speaking on the subject of purchase tax recently, said that a case could be made out for dropping the tax on many kinds of goods, but the money had to be obtained by some means. I cannot see that this applies to electric immersion heaters, for the 100 per cent tax was put on specifically to ease the load position. Now the Boards are endeavouring to attract this desirable—largely off-peak—load, but the tax remains.

★ ★ ★

We are all prone to believe what we would like to be true. That accounts for the different impressions gained by electrical and gas investigators into housewives' choice of cooking methods. From inquiries in various parts of the country it has appeared to electrical people that electric cooking is favoured. The gas industry says that over 70 per cent of housewives prefer to cook by gas. It is conceivable, of course, that women may colour their answers to suit the investigators' requirements.

★ ★ ★

In this country we are still some way behind places like Canada, for example, in the amount of electricity used per head of the population. On this point Mr. C. T. Melling, chairman of the Eastern Electricity Board, in a recent message to the staff, comments on the scope for development. He refers to the fact that in 1949 only £1 14s was spent on electricity per head of the population compared with £15 on tobacco and £10 on beer. From these facts Mr. Melling deduces that, broadly speaking, the cost of electricity is not a major obstacle to future development of its use in the home, and he feels that there is an enormous potential market. At present plant and mains capacity restrict the ability to exploit this market to the fullest extent, but there is scope for improving load factor by developing off-peak supplies.

★ ★ ★

From *Contact*, the magazine of the Merseyside and North Wales Electricity Board, comes the following story described as "amazing but true." A lady complained about the size of her electricity bill. "I can't understand how it is so much, especially as I was away for a long holiday during this period, and to prevent any leakage I removed all electric light bulbs and fitted corks in their places." She probably forgot to plug the sockets.

★ ★ ★

One of the latest discoveries by the *Evening News* is a young man who is preparing an exhibition of electrical phenomena. He is said to have a generator producing up to 400 kV and is reported as saying: "For several months, working from lower voltages, I have been hardening myself to take the maximum. The shock stiffens my arm at the time, but afterwards I feel better for it." This seems to me to be a rather violent form of electro-therapy.

★ ★ ★

The latest "electricity and fish" story comes from Russia. It tells of an "electric fish pump" for trawlers which is said to make use of an electric field to attract the fish which, when gathered into a shoal, are sucked into the trawler's hold, the water then being removed. Such schemes as this are likely to prejudice fish against electrical development.

# Grain Dryers

## *Electricity as a Source of Heat for Farm Use*

By P. G. FINN-KELCEY, A.M.I.E.E.*

DURING the 1949 harvest some 9,000 combine-harvesters were in use on our farms, in many cases replacing the time-honoured method of harvesting with the reaper-binder. By the older method the farmer cuts his corn crop, leaving the sheaves in the field a few days or, in many cases, weeks before they are stacked and thatched, or carted into barns. During the period in the field the grain continues to ripen and lose its surplus moisture and the drying process, a long and slow one, is continued in the stack, which by nature is self-ventilating.

Although many of the larger farms have their own threshing tackle, most of the stacks in a district are dealt with in turn by a contractor's outfit touring the neighbourhood, the threshing season being spread from September round to the end of the following spring. This system has many virtues, not least of which is the even flow of grain from farm to merchant which results from it and, with the exception of grain from a few badly built stacks that have let in the rain, the bulk of this grain does not require drying.

The merchants' storage capacity for home-produced grain is therefore adequate for, say, a month's or six weeks' normal intake and his drying plant is designed to handle perhaps 10 per cent of this. In electrical parlance, his installed capacity is low and his plant load factor high, for during the months when no home-grown grain is coming in he will be handling shipments from North America and the southern hemisphere.

The coming of the combine-harvester to this country has considerably upset this well-tried and efficient system and the position will become progressively worse as the number of these machines increases. Year by year a greater proportion of the home-grown grain will be threshed and ready for marketing during the months of August and September and it must be clearly recognized that it is the farmer and not the merchant who has brought about this changed condition.

Nobody would suggest that farmers should revert to their former methods of harvesting which, with the present cost and scarcity of labour, would be both an uneconomic and a retrograde step; but the onus of drying, when and where necessary, and of storing the grain in good condition until it is required by the merchant obviously falls on the farmer who has previously conditioned and stored the grain in his stacks. The Ministry of Agriculture, in fixing the prices for home-grown millable wheat, has provided some financial encouragement to farmers to build their own grain storage by offering prices which rise month by month to the maximum of approximately £3/ton above the price ruling at harvest-time.

### Heavy Capital Cost

To provide a farm grain-drying installation has always meant a heavy outlay of capital, for not only is there the cost of the dryer itself, but a pre-cleaner, a dressing machine, elevators and other items must also be provided if the bulk grain is to be handled efficiently. Such an installation could be justified for dealing with, say, 200 acres of grain or more, but the capital cost could not be scaled down proportionately to suit the pocket of the farmer with about 100 acres or less. For the smaller farms combine-harvesters with 5ft or 6ft cutter-bars are now becoming more plentiful and they are well suited to these conditions, both in price

* Electrical Research Association, Field Station, Shinfield Green, Reading, Berks.

and capacity, whereas among the existing range of proprietary grain dryers there is, with one possible exception, nothing suitable.

During the 1949 harvest, which was exceptionally dry, many farm grain dryers south of a line from the Wash to the Severn were not used at all, while during the 1947 harvest only a small percentage of the grain required drying. North of this imaginary line grain dryers are generally regarded as a necessity but, because that is not the best of corn-growing land and since the price emphasis may go from corn to livestock without much warning, the farmers there are wary about raising a great deal of capital for drying equipment.

The manufacturers of farm dryers have not, therefore, a wide market for costly machines and building down to a price has inevitably resulted in a loss of thermal efficiency which in most cases is appallingly low and, with one possible exception, thermal lagging of any part of a farm dryer is just unknown. Industrial heating engineers may throw up their hands in horror at such a state of affairs and quote cases in which they have saved factory owners many hundreds of pounds yearly in fuel bills by lagging some piece of equipment.

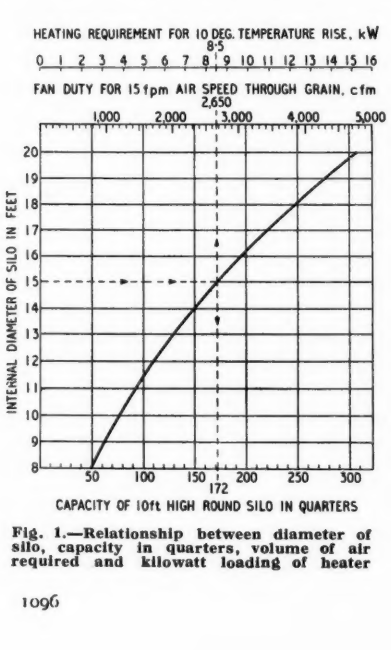

HEATING REQUIREMENT FOR 10 DEG. TEMPERATURE RISE, kW
8·5
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
FAN DUTY FOR 15 fpm AIR SPEED THROUGH GRAIN, cfm
2,650
1,000 2,000 3,000 4,000 5,000
INTERNAL DIAMETER OF SILO IN FEET
20 19 18 17 16 15 14 13 12 11 10 9 8
50 100 150 172 200 250 300
CAPACITY OF 10ft HIGH ROUND SILO IN QUARTERS

**Fig. 1.—Relationship between diameter of silo, capacity in quarters, volume of air required and kilowatt loading of heater**

Summarizing the farmers' point of view, however, the following must be considered:—

(1) The dryer may only be used to any extent every second or third season and, at worst, it will only be used for 20 to 30 working days per annum.

(2) In a wet season the cost of solid fuel will be only 4s to 5s for every ton of dried grain, selling at £20-£30.

(3) Increasing thermal efficiency from 33⅓ to 50 per cent at a capital cost of, say, £250 would perhaps yield a cash saving of £9 or £10 annually on a farm drying 250 tons of grain.

(4) Farmers, like many other owners of small businesses, find it preferable to incur slightly higher running costs than to raise further capital.

## Farmers' Acceptance

The possibilities of electric heating for farm grain dryers have probably caused more debate among those concerned with rural electrification than any other single topic. In the past a number of these plants have been installed. On the whole these installations have proved acceptable to the farmer despite the increased running costs involved through using this high-grade form of heat in a thermally inefficient machine.

The installed capacity of these installations has been of the order of 130-250 kVA, so with the inevitably poor load factor, even in a wet season, this type of load has not been without its embarrassment to the supply engineers and tariff officers. The direct substitution of a resistance type air heater for a crude and cheap form of solid (or liquid) fuel furnace has never been considered as the final answer of our industry to the grain-drying problem. For some years now research and development work has been going on with a view to producing a compact and thermally efficient dryer with a low maximum demand, close temperature control and, if possible, one that will operate 24 hours per day without full-time attention.

Great credit is due to the workers at the National Institute of Agricultural Engineering for producing the first real glimmer of hope for the rural supply engineers so far as the grain-drying load

is concerned. Their first development, known as bin ventilation, which was first tried out on a commercial scale in the 1948 season, has caught the imagination of farmers and supply authorities alike and it will undoubtedly be installed on many farms, particularly those south of the "Wash - Severn" line. The first report,* intelligently interpreted, will provide a satisfactory and workable solution to many farmers' grain-drying and storage worries.

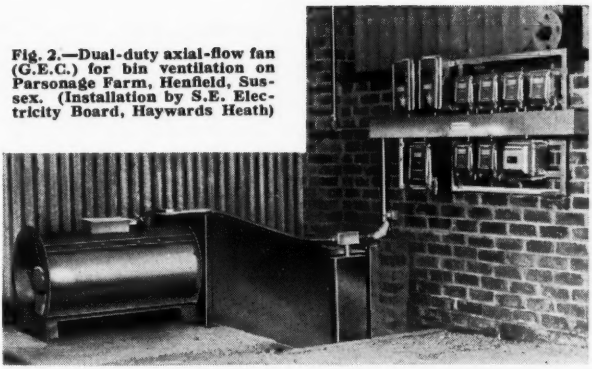


**Fig. 2.—Dual-duty axial-flow fan (G.E.C.) for bin ventilation on Parsonage Farm, Henfield, Sussex. (Installation by S.E. Electricity Board, Haywards Heath)**

In brief, the prototype plant consisted of six circular bins of reinforced concrete fitted with foamed slag floors and supported above individual plenum chambers: each bin was connected via an air valve to a common main duct at the end of which was fitted the ventilating fan. Of the six bins, each holding about 130 quarters of grain (8 bushels or 2 sacks = 1 quarter) four could be ventilated simultaneously and the whole outfit was designed to handle the grain from 150 acres.

The following summary of the installation and its performance may be of interest bearing in mind that the 1948 season can probably be regarded as "average" so far as weather and crops were concerned:—

Total cost of installation, £1,010.
Capital cost/ton of storage capacity, £7 10s (26s per quarter).
Cost of electrical equipment and wiring, £154.
One conveying, one ventilating fan, £91.
Connected load, 22 kW approx.
Energy consumed, kWh: (1) fans, 3,830 at 1.7d, £27 2s 6d; (2) heating, 2,820 at 1.1d, £12 18s 6d.
Total time fan operation, 589 hours between 16th August and 23rd September.
Tonnage dried and conveyed per kVA installed, 7.5 approx.
Energy used per ton dried and conveyed, 40 kWh (4s 10d).
Average moisture extraction 19.2 to 16.2 per cent.

Points to be investigated in further trials before the final recommendations can be laid down are, first, the minimum temperature, or temperature rise, required in different parts of the country to give a rate of drying that will prevent moulding or caking of the grain. The true criterion of the rate of drying is the relative humidity rather than the temperature of the air entering the bins, but as there is a fairly close relationship between them at any given locality and time of the year and, as temperature can be read directly and with greater accuracy, it is the more practical way of specifying the air conditions.

Secondly, the optimum rate of airflow required per minute for satisfactory drying. Operational experience has shown that 15 c.f.m./sq ft of bin floor is probably the optimum figure; the airflow, however, cannot be closely controlled or predicted in practice, as one bin only may be in use, or two, three or four bins may require ventilating simultaneously. The depth, degree of settling, type and moisture content of the grain in each bin may vary considerably and all influence the proportion of the air that reaches each bin. Depth is the main factor and if a considerable quantity of wet grain is coming into the plant, it should be shared among the bins as far as possible so that an excessive depth is avoided in any one.

Fan manufacturers will advise on the selection of a suitable fan for the duty, but briefly one is required that (a) gives adequate volume (as indicated by Fig. I), (b) has a stall-point over 6in water gauge, (c) has as flat a horse-power characteristic as possible and (d) is of the non-overloading type. Either dual-duty axial-flow

* "Report on a Farm Plant for the Drying of Grain in Storage Bins Ventilated with Conditioned Air." obtainable from the secretary, N.I.A.E., Wrest Park, Silsoe, Beds.

fans of the type illustrated (Fig. 2) or the centrifugal type (Fig. 3) which is also available with directly coupled motor will be suitable for the work.

Thirdly, the extremes of water gauge pressure and airflow that may be encountered in a multi-bin installation. Generally speaking, the resistance to airflow will be the maximum, say 5in to 6in w.g., when one bin only is being ventilated and the volume will be at the minimum. With four bins "in parallel," the resistance will drop to perhaps one-half of its former value and the volume will increase in accordance with the volume characteristic of the fan.

Fourthly, the most satisfactory manual or automatic method of controlling the supplementary air heating. All agree that the most efficient method of effecting control would be to maintain the relative humidity of the air entering the grain at or below a figure of 65 per cent or so. If the ambient relative humidity fell below the selected figure, no heating would be necessary, but when it rose above that value the minimum of heat would be applied to maintain it at or near 65 per cent. The electrical gear for such fine control is fairly costly, however, and various cheaper modifications, also employing a humidistat, or possibly graded thermostats, could be used at the expense of some increase in running costs.

## N.I.A.E. Crop Dryer

The National Institute of Agricultural Engineering has more recently produced a technical memorandum entitled "The N.I.A.E. Crop Dryer 1949" which again concerns grain drying in particular, although this device may be used for drying a variety of farm materials. It involves far less capital expenditure than the ventilated bins discussed above, but does not incorporate storage. Briefly it consists of a plenum chamber 18in deep covered with concrete slabs having rectangular openings in them and over which the sacks of grain are placed. Air heated by some 25 degrees F is blown into the plenum and passes through the grain, reducing the moisture content by slightly less than 1 per cent per hour. A typical size of installation would be a "40 holer," that is one to dry 40 standard M.A.F. hessian sacks holding 1 cwt each.

The prototype installation employed a combined oil heater and fan unit, the products of combustion being used directly for the drying process, but this form of heater, besides being expensive, involves a considerable risk in the event of the burner becoming extinguished. Not only would the plenum chamber immediately be filled with an explosive mixture, but the grain would inevitably become tainted with the vaporized oil. With electric heating these difficulties do not arise and the capital cost is reduced to something less than half that of direct heating by oil-fired equipment.

The electric heating load for such an installation would be of the order of 40 kW to give a temperature rise of 25 deg F to an airflow of 5,000 c.f.m. Neither the 25 deg rise nor the airflow are critical values, but it has been found empirically that they will dry at an approximate rate of 1 per cent per hour. It may well be that such a drying rate is higher than necessary in the east and south of the country where an average of, say, 3 per cent moisture has to be removed. In such cases the loading could be materially reduced and the airflow lowered proportionately so that the stated 25 deg F differential is maintained.

The water gauge resistance offered by these dryers is low, about 0.75in w.g., and a single-stage axial-flow fan with heater attached (Fig. 4) is a neat and simple unit.

To match a 5ft or 6ft combine this simple form of dryer has many attractions; it does not require skilled or constant attention and, moreover, the platform with gratings and brickwork should not cost more than £70 or so, to which must be added the heater unit, fan,

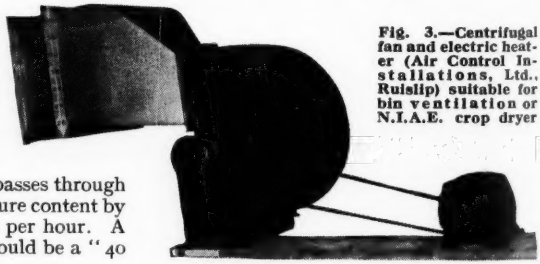
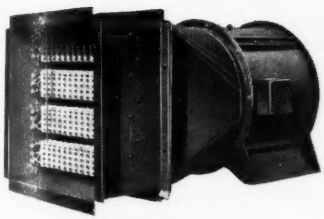
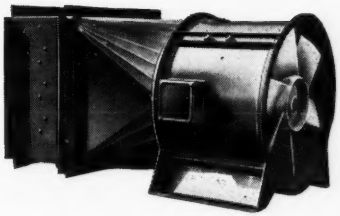


**Fig. 3.—Centrifugal fan and electric heater (Air Control Installations, Ltd., Ruislip) suitable for bin ventilation or N.I.A.E. crop dryer**





Figs. 4 and 5.—Heater end and fan end of (G.E.C.) unit for N.I.A.E. type crop dryer.

switchgear and wiring, making a total capital expenditure of, say, £200. The cost of electricity for drying a ton of grain will be perhaps twice that of the ventilated-bin system, but the low initial cost of the plant and the wide variety of uses for it should outweigh this.

While the various tariff committees are considering the vexed question of rural tariffs, they would do well to consider a special rate for crop-drying purposes. The potential revenue is higher than that from any other single source; the load factor is good and the season of operations extends roughly from 1st May to 30th September, avoiding the winter peak. If the electrical industry does not take the initiative in the agricultural market and pursue these two sources of revenue in 1950, a golden opportunity for rendering a real service to the farming community will have been lost.

## Pakistan Power Prospects

AT a recent conference Mr. Chandri Nazir Ahmad Khan, Minister of Industries, Pakistan, reviewed the present power position of the country and outlined plans for the immediate future Despite its great potentialities, Pakistan inherited only two small hydro-electric stations generating about 10,000 kW. A conference convened in 1947 to assess the demand for water-power laid down an ambitious target of 500,000 kW to be attained in five years. In February, 1948, the Government of Pakistan invited Sir Henry Howard to make a rapid survey and his more modest and realistic estimates totalled 199,000 kW. In April, 1948, a conference was held in Karachi to consider the creation of a Central Engineering Authority, fixing of power targets and the question of nationalization of existing electricity undertakings. Following its deliberations the Central Engineering Authority was set up on 1st July, 1948, and to assist the C.E.A. in coping with the many complex problems the Pakistan Government appointed Messrs. Merz, Rendel & Vattern (Pakistan), a combination of three firms of consulting engineers, as their consultants.

As a first step towards improving the power supply position the Government invited their attention to the rehabilitation of existing stations. Then they were asked to carry out a detailed load survey of the entire country and prepare an overall plan embracing fuel and hydro-electric resources; future load possibilities with plans for the location of new industries and factories; an emergency scheme to meet the present power shortage; survey of communications; and long-term training of engineers. The consulting engineers' plan will not be ready for another six months.

## World Power Conference

MEMBERSHIP registrations for the fourth World Power Conference, which is to take place in London (10th to 15th July), exceed 1,350, about one-half from 40 Commonwealth and foreign countries and the other half from the United Kingdom. The time-table shows that on Tuesday morning there will be a single technical session, when 26 national reports on energy resources and power developments will be discussed. There will be three sessions simultaneously on the Wednesday and Thursday mornings and afternoons, two on the Friday morning and a single session in the afternoon on atomic energy, when papers from Britain, Canada, France, Sweden and the United States will be discussed.

# AGRICULTURAL SHOWS

## *Electrical Displays at Barnstaple and Letchworth*

At the Devon County Show, which was held at Chivenor Aerodrome, Barnstaple, on three days recently, the South Western Electricity Board had a marquee in which was displayed a comprehensive range of appliances of particular interest to the farming community. In the entrance to the pavilion there were mural display panels depicting the chain of distribution of electricity from the power station to the farm, and illustrating the special problems of rural development which are encountered in the area of the South Western Board.

Distinguished visitors to the Show included the Duchess of Gloucester, who was particularly interested in a deep freezing cabinet and a new milk cooling unit which has been developed to the Board's specification following experience with a prototype in Cornwall.

To provide an electricity supply for the Show the Board erected nearly a mile of 11,000 V overhead line, over half a mile of low-voltage distribution line, and a 500 kVA transformer.

The Eastern Electricity Board is taking part in nine County Shows, the first — the Hertfordshire Show at Willian, near Letchworth — being held recently. The displays will be substantially the same at all these events, and in the accompanying picture we illustrate a section of the Board's stand at the Hertfordshire Show, on which were exhibited farm machinery, dairy, horticultural, poultry, water supplies, workshop and domestic appliances.

The other agricultural shows in which the Board is taking part during the summer are as follows. Cambridgeshire and Isle of Ely, March (27th May); Suffolk, Benacre Park, Eccles (31st May and 1st June); Essex, Braintree (7th and 8th June); Huntingdonshire, St. Ives (17th June); Royal Norfolk, Anmer, nr. Sandringham (28th and 29th June); Bedfordshire, Bedford (14th and 15th July); Peterborough (18th-20th July); Thame (21st September).

**Above: A section of the Eastern Electricity Board's display which is being exhibited at various agricultural shows in its area**

**Left: Pavilion of the South Western Electricity Board at the Devon County Show**

# ELECTRICAL CONTRACTING: Organization and Routine

By H. R. TAUNTON, A.M.I.E.E

## 6—*Dealing with Inquiries*

THE plums of the morning mail are, of course, orders, and after them the heart of the contractor is most rejoiced by "firm" inquiries: inquiries which have passed the cultivation stage and become definite invitations to tender. The smaller, which can be taken in the stride of the day's work, should be quoted for promptly. Left too long, an impatient customer will have placed his order elsewhere by the time your perhaps more favourable offer reaches him—so that he will be doubly annoyed.

In the case of larger inquiries, the estimates for which will need more preparation, a date by which the tender must be submitted is usually stipulated. If not, the estimator should decide one for himself, one that the customer is likely to think reasonable, and adhere to it as rigidly as to any that is obligatory. There is always a temptation under pressure of work to postpone the optional; postponement becomes procrastination, and that, sooner or later, means a possible order lost. On the other hand, it is inadvisable to submit a tender for competitive work before the appointed date. There are occasions when prudence will suggest handing it in on the very stroke of the hour—and even then prudence may be disappointed.

### Preparation of Estimate

With the due date before him, the wise contractor will not leave to the last moment the work of preparing his estimate. Some specifications entail a quite unexpected amount of work in proportion to the amount of the tender. "Break the back" of the job at the earliest possible moment, and be sure of ample time for checking and reconsideration of dubious factors before filling in the final figures.

One thing should never be postponed, and that is the first reading of the specification. In two cases out of three it will call for certain material for which special quotations will have to be obtained from makers who may want time to prepare them. Delay may mean a rush to the telephone for hasty, ill-considered figures, or the estimator may be thrown back on his own resources of inadequate catalogues and guess-work.

### Form of Specification

Inquiries for installation work vary widely in the data which accompanies them. From a consultant these may be very full: a detailed specification with schedules, diagrams and explanatory drawings, and complete plans. At the other extreme will be a simple letter from a private individual asking for a price for the electrical equipment of his premises. Between these two is every variety: specifications wordy and vague, plans without schedules, and schedules without plans. Whatever their shortcomings, they must be made good. Complete and exact data are an essential preliminary to accurate estimating.

Even the full specifications of consulting engineers are of as many kinds as the consultants who devise them. A competent man can often say, and say better, in six pages all that another will spread over twenty, full of padding and unnecessary *clichés*. The experienced contractor will take this verbiage for what it is worth, though he will not omit to read it—it will sometimes contain an unexpected snag.

The merits of a specification may often be judged by the resulting tenders. If they cover a wide range, the fault usually lies in the varying constructions the competing estimators have put on a defective one. Not always, of course. Even contractors make mistakes at times, either from inexperience or sheer carelessness.

Responsible contractors will always prefer, when in competition, to quote to a rigid specification drawn up by a competent engineer. All competitors will be quoting on equal terms and, given equal accuracy in estimating, the result will de-

pend solely on the percentage each may decide to add to his costs to cover overheads and profit — ignoring for the moment the disturbing factor of a gamble on extras.

## Where Price Decides

The handicap on fair trading is most marked where a private individual invites several firms to submit schemes and estimates for a job of which no specification is provided. The firm with high standards will work out an adequate scheme, with a full and fair specification, and submit a price which will cover a sound job with good material and workmanship. But if the order is placed on price alone, as in such cases it usually is, they will be hopelessly out of the running against some less scrupulous firm which will draft a scheme on the most meagre lines, with a specification which, where it is not vague, will plump for an entirely cheaper grade of material. Almost always the customer will accept the resultant cheaper job. He gets it in every sense of the word —although he often has to foot a bill for cunning extras which will leave him little the gainer, even in initial cost. And, incidentally, a cheapjack is encouraged, a responsible firm employing skilled men receives a setback, and the whole standard of electrical installation work is lowered and its good name imperilled.

If the specification the responsible contractor has received is a full, precise one, he can go ahead with his estimating, confident that he will not be unfairly undercut by some tuppenny-ha'penny firm. In fact, in such cases the advantage is often with the bigger and better firm. The cheapjack will probably be out of his depth and take refuge in excessive caution.

Where the specification is more open, leaving loopholes for cheaper alternatives, the only thing to do is to take note of them as keenly as will the unscrupulous competitor. Then quote the lowest price they will permit, which should then compare favourably with any other. At the same time, define what that price covers and supplement it by such additional figures as will bring it to a total which will cover the probable true requirements of the purchaser. Some tactful wording is necessary: "We have assumed in estimating that . . . , and our price will therefore be such-and-such; but if the intention of paragraph *x* of the specification is that . . ." or "if, as we strongly recommend, we supply so-and-so, the extra cost will be . . ." and so on.

In the third case, where the inquiry is received with no more than a mere outline of general requirements, and irresponsible competition is to be anticipated, the best plan is to prepare one or more alternative schemes and quote for each. The recommended scheme should be reinforced by every argument which will secure its adoption, expressed in terms which will convey meaning, and perhaps conviction, to the layman. The alternatives should be impartially discussed, any merits they have receiving due mention. "A is the job we recommend, but B is still a good one," will inspire more confidence than "A is a good job, but if you must have a cheap one, here's B." In each case, too, it is well to supplement the lump sum by schedule rates for possible variations. This is done willy-nilly when quoting to a consultant's specification; and done voluntarily in the circumstances we are discussing has definite advantages, helping the customer to make a fair comparison with an apparently lower tender.

We will assume that the contractor has been favoured by an inquiry accompanied by a satisfactorily complete specification. This will comprise:—

(*A*) general conditions; (*B*) description of the work required; (*C*) detailed specification of material; (*D*) schedules; (*E*) diagrams, where necessary; (*F*) form of tender.

## Contract Conditions

The general conditions, (*A*), will define the various parties interested and the contractor's liability in respect of insurance, guarantee, maintenance and, usually, completion by a given date. It will state what facilities will or will not be provided by the building contractor. It will give in detail the terms of payment; and will, or should, include an arbitration clause. Other clauses, more variable, may follow, sometimes necessitated by the special conditions of the work. It will usually conclude with clauses covering the omission of anything undefined which may be reasonably necessary to its completion and ensuring its general conformity with certain named regulations.

Much of the above is familiar to the contractor by constant repetition. He will usually be fully covered already by normal policies against the required insurance. The guarantee and maintenance periods named rarely exceed a reasonable twelve months. The date for completion, whether stated or to be given by him, is often a dead letter, and any penalty is for one reason or another little likely to be enforced. The responsibility for cutting away and making good varies, and should be carefully noted.

## Payment Terms

The terms of payment are important. Usual and fair terms are: 80 per cent on certificate as the work proceeds, 15 per cent on completion, and 5 per cent to be retained until the expiration of the guarantee. It is sometimes stipulated that the tender should provide for a cash discount of 2½ per cent to the general contractor, through whom the order and subsequent payments will be passed. If it is not stipulated, the contrary should be expressly stated in a letter covering the tender. Unless the point is defined, the sub-contractor may find the builder claiming this discount as his right—which it is not—leading to vexatious dispute. If, however, the specification embodies the Form of Agreement and Schedule of Conditions issued by the R.I.B.A., it automatically entitles the general contractor to this discount.

The general conditions sometimes go on to define the terms on which charges for day-work are to be made, usually on the basis of a stated percentage on the costs of labour and material. These should be carefully noted, as they are sometimes unfairly low, having regard to the high proportion of electrical contractors' standing charges to their turnover. In this connection, any proviso that these charges shall be on the basis defined in the *general* contract should be investigated before it is accepted. (It is more commonly made in the form of sub-contract which the general contractor will later invite the sub-contractor to sign.) The percentages on cost of day-work which are reasonable for a builder with his vastly greater turnover are usually quite impossible to the electrical contractor.

The "conformity" clauses need not, as a rule, trouble any responsible contractor. The Factory Regulations should be known to him, and his normal practice should conform to the I.E.E. Regulations, although sometimes the consultant's own requirements are far more stringent on any defined point.

(*B*) The second part of a specification —a description of the general scheme of the proposed installation—is the important kernel of the whole. It should give particulars of the electrical services available, and details and sizes of the main control gear and of the system of distribution, cables and fuseboards. It is, in fact, a precise summary of the work and the purposes it is to serve, sectionalized when necessary. If any diagrams or drawings (*E*) are supplied, apart from plans, they will be by way of illustration of this part of the specification. The positions of various gear and the proposed runs of mains and sub-mains are important data and may seriously affect the estimator's calculations. If they are not available, the precise location assumed for the company's intake and the main switch-room should be defined in a covering letter to the tender.

## Type of Equipment

(*C*) Next follows the specification proper, defining the types, grades, sizes and other required details of the main gear, conduit, cable, accessories, fittings and other material, with whatever special rules and restrictions the consultant or architect may think necessary to govern the methods in which it is to be installed. Much of the material used to-day on electrical contracts is more or less standardized, especially the conduit and cable; and there is often little noteworthy or novel in the wordy details to which some engineers are addicted

Accessories are commonly specified as "so-and-so's" make "or equal," which may be capable of elastic interpretation. Some consultants, on the other hand, give the tenderer no such option, but state definitely the make and catalogue numbers of the various items. Some contractors resent having their hands tied in this way, but a consultant has as much right as they to a preference for a particular make or type of material. Why should he not express it, if he thinks it is in the interest of his client? And, from

the contractor's point of view, the practice has the advantage of securing a greater equality of tendering.

In any but the simplest installations there will probably be certain requirements which cannot be accurately predetermined, or which will have to be specially designed later. This is commonly the case with fittings, especially ornamental fittings. Such items are generally covered by a provisional sum or a P.C. sum, and a special note should be made of them.

(*D*) The schedules attached to a specification are usually the only approach to definite quantities it affords and, in conjunction with the plans, form the basis of those the estimator must work out for himself. The commonest schedule is, of course, that of the points in a lighting installation; but additional schedules of motors, heating points, fittings and whatnot, in endless variety, may be necessary in many cases. The most convenient schedule of points from the estimator's viewpoint is that in which each is numbered to correspond with the marked positions on a plan. This facilitates checking of the two. Discrepancies are quite common and should be cleared up if they are serious.

Schedules are usually tabulated, although certain engineers adopt an irritating narrative form which necessitates recasting before it can be properly checked and totalled for quantities. To afford the full information needed for estimating, in the most convenient form, columns should be provided for:—

(*a*) The general position marked on the plan, with reference numbers; (*b*) the number of points of the same type in each position; (*c*) their individual wattage; (*d*) their total wattage (if the individual wattages are not in so many separate columns); (*e*) switch controls, differentiating special types, such as two-way switches, by suitable indices; (*f*) plug and switchplug points, differentiated in the same way; (*g*) any other special points; (*h*) fittings, indicated by initials, if catalogue numbers are not possible; (*i*) notes when necessary.

All this, at first sight, seems to involve a wide paper and to keep it within the limits of a quarto sheet, some may be, and commonly are, omitted or combined. The essential ones are (*a*) (the widest), (*b*), (*c*) and (*e*); (*d*) is useful, as its total gives the installation load; (*f*) and (*g*) may be combined, and (*h*) and (*i*); or (*h*) may be the subject of a separate schedule, and the width occupied by (*i*) reduced by the use of indices to terminal notes.

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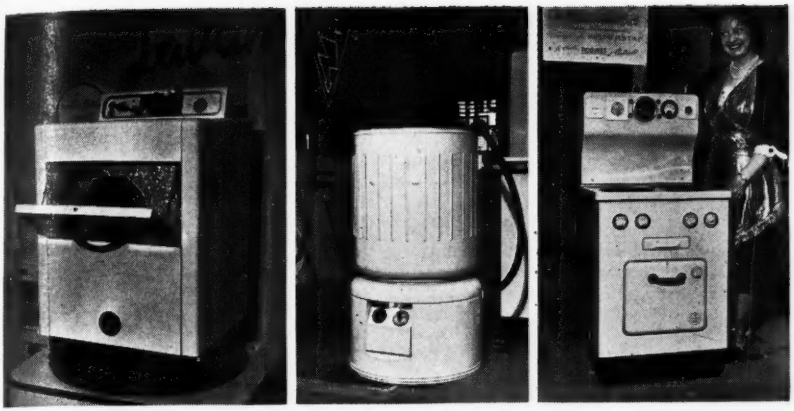
# The Paris Fair

***From Our Paris Correspondent***

THE electrical section of this year's Paris Fair covered 15,000 sq metres; it was one of the most important sections. As usual, the domestic exhibits proved the most interesting, although in the industrial section, which was situated in the Heavy Industries and Machine Tools Hall, there were one or two developments worth noting. For example, Sciaky had a three-phase spot welder on show which was claimed to cut power consumption by up to 75 per cent. Among other apparatus on show were precision millivoltmeters, generators and motors, magneto-electronic apparatus, new-type pyrometers and magnetic amplifiers.

In the domestic section were a remarkable number of washing machines. Since laundries are now very expensive and washing machines beyond the pockets of the ordinary householder, "washing salons" have been opened. These businesses take in dirty linen which they wash, rinse and return to the owner in a remarkably short time.

The Lavandor was one of the most interesting, although all work on the same system. The different cycles are controlled by levers seen in the illustration. Built in sheet steel, this washer is 67 cm long, 58 cm wide and 94 cm high. A normal "salon" may have 10 to 12 such machines installed. The machine is heated by gas and has a copper washing "drum." Operation of the control levers fills the drum with water (33 litres), turns



**The Lavandor "Salon" washing machine; the "Centrix" washer; and the "Cordon Bleu" cooker**

on the heat (it takes 25 minutes to reach boiling point), starts the motor for revolving the drum and empties the drum after washing.

The capacity of the machine is 5 kg of dry washing per 50 minutes. Each machine is equipped with a time switch. (Applications Electro-Mécaniques Vannier, 10-18, Rue St. Fursy, Pirenne (Somme).)

The LadenOmatic (Laden, 296, Rue Lecourbe, Paris XV) is a similar machine, although the control board, unlike that of the Lavandor, is separate and has to be fixed to the wall over the actual washer. Its power consumption is 700 W and its capacity 5 kg of washing per hour.

There were, of course, the usual collection of home washers, none of which offered any striking novelty, although the "Centrix" (Sté d'Appareillage Electrique, 137-148, Rue Gerland, Lyon) included one or two modifications. It has been greatly simplified and can be plugged into an ordinary lighting socket.

Electric cookers were the same as those seen at last year's Fair or at the Salon des Arts Ménagers held in February. There were one or two minor modifications, but these were selling points rather than technical or significant improvements. For example, on one cooker the switches controlling the hot plate or oven elements, instead of being marked one to three, have three wavy red lines which light up as the position changes. The "Automatique Cordon Bleu" (U.C.M.E., 28, Rue Debucourt, Paris 17) is a somewhat complicated cooker equipped with a "Simmerstat" and timing device.

## Television in Switzerland

SWITZERLAND intends to introduce television in the near future and proposes a standard of 625 lines and 25 frames/sec. The first stage in the development of a Swiss directional network was the establishment of a telephony link between Zurich and Geneva with relay stations on the Uetliberg and the Chasseral. The relay station on the Chasseral has been enlarged in the course of the past year and its own power plant has been installed. It is expected to play a big part in international telephony traffic. The Chasseral is mentioned as one of the high-altitude stations, together with the Dole, the Santis, Pilatus and San Salvatore, for eventual use in television transmission. In view of the mountainous nature of the country in some localities, relay stations will be used near the larger towns, e.g., on the Uetliberg for Zurich and the Gurten for Berne. It can be assumed that in the eventual television network a relay station will be required on the average every 100 km. The repeater installation and aerials would cost in each case about 50,000 Sw. fr.

These plans are only provisional and further experiments will be necessary before a final plan for the Swiss television network can be evolved.

# NEW BOOKS

**Wireless Simply Explained.** By R. W. Hallows, M.A. (Cantab.), M.I.E.E. Pp. 255; figs. 111; index. Chapman & Hall, Ltd., 37, Essex Street, London, W.C.2. Price 10s 6d.

Radio is not the easiest of subjects to understand and more often than not its study involves complicated mathematics and circuit techniques which are unfamiliar to the power engineer. In this little book, however, the author explains "how it works" in a simple and lucid manner so that even those with little or no knowledge of electricity will be able to grasp the fundamental principles. Furthermore, he does not try to impress or frighten readers with his mathematical dexterity or his understanding of highly complicated circuit arrangements.

The book begins with a brief outline of radio transmission, passing on to air waves and sound and thence to the microphone, telephone receiver and loudspeaker. Electrical wave theory is discussed, together with the basic tuned circuits upon which radio reception depends. After treating the principles of radiation, transmission and reception the author comes to the valve, the applications of which he describes to detection, amplification, oscillator circuits and so on up to the superheterodyne receiver, which is used almost exclusively for domestic purposes to-day. In conclusion, Mr. Hallows explains the classification and functional properties of the different frequency bands and outlines the difference between, and respective advantages of, frequency modulated, amplitude modulated and other broadcasting systems.

Four appendices contribute to the general usefulness of this book, which can be thoroughly recommended.—R. P.

**Electron Tube Circuits.** By Samuel Seely. Pp. 529; figs. and index. McGraw-Hill Publishing Co., Ltd., Aldwych House, Aldwych, London, W.C.2. Price 51s in U.K.

This book is in two parts, the first, about 80 per cent of the total, on predominantly radio circuits and the second on pulse and television circuitry. It is intended as an undergraduate textbook and the main emphasis is on a consistent theory of the principles used in circuit design rather than handbook information on specific circuits. As is to be expected, most of the contents is standard material contained in a number of existing books. Some of the matter is, however, new to books of this type, although it has appeared in specialist publications. Instances are a chapter on electronic computing circuits, a rather full treatment of the behaviour of electronic voltage and current stabilizers and much of the material contained in the pulse section.

The treatment is based on a clear and logical discussion of valves as circuit elements. The mathematics used is confined to elementary calculus, with a few very simple operational methods, but no matrix theory or any of the more advanced types of circuit analysis is used. The book is a good workmanlike job, and anyone buying a copy is sure to use it frequently, but the high price and ready availability of the material make it doubtful whether it will have a wide circulation in this country.—A. H. B.

**Patents and Registered Designs.** By T. A. Blanco White, Barrister-at-Law. (79 pp.) Stevens & Sons, Ltd., 119-120, Chancery Lane, London, W.C.2. Price 4s.

This second edition of a work first published in 1947 has been considerably revised in the light of last year's patent legislation. There is a new chapter upon the Monopolies Commission set up under the 1948 Act.

## Books Received

**Electrical Transmission of Power and Signals.** By E. W. Kimbark. Pp. 461; figs. and index. Chapman & Hall, Ltd., 37, Essex Street, London, W.C.2. Price 48s in U.K.

**Data and Circuits of Modern Receiver and Amplifier Valves.** Book II. Pp. 406; figs. 532. Price 21s. Book III. Pp. 213; figs. 267. Price 12s 6d. The Cleaver Hume Press, 42a, South Audley Street, London, W.1 (for Philips-Netherlands, Ltd.).

# HOUSE OF COMMONS LIGHTING

## *Fittings to Meet Special Requirements*

IN addition to supplying all the special lighting fittings, lamps, gear and control apparatus for the main chamber in the new House of Commons, the General Electric Co., Ltd., received the contract for all the general lighting fittings in the precincts of the House. About 75 per cent of these are being made at the company's Magnet Works, Birmingham, and all fittings in the installation will be equipped with G.E.C. gear. Over 400 of one type of fitting are being made there in various sizes to take two, three or four "Osram" fluorescent lamps of the 2 ft and 4 ft lengths. The design, as of all other fittings in the House, is by Sir Giles Gilbert Scott.

All technical and associated problems arising in the design of fittings have been the subject of special study by the Research Laboratories and Illuminating Engineering Department of the G.E.C. in collaboration with the architect and with the consulting engineers, Dr. Oscar Faber & Partners.

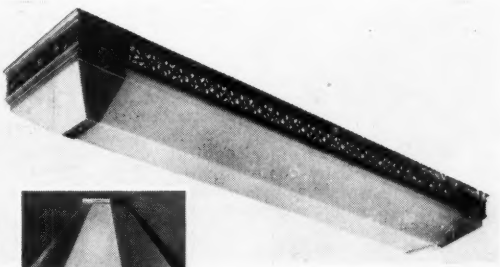
To hasten completion of the work in the time required part of the work of producing the lighting fittings is being carried out by Osler & Faraday, Ltd., and Smith & Ansell, Ltd. (a subsidiary of Falk, Stadelmann & Co., Ltd.). A few days ago we had the opportunity of visiting the Acocks Green, Birmingham, factory of the latter company where Mr. Ben Ansell, a director, showed us the fittings in course of construction.

The House presents a variety of problems to the lighting designers which do not permit uniform treatment and the solutions have involved the use of fluorescent and tungsten lamps in various forms. In many cases the fittings combine the dual function of lighting and providing outlets for the air-conditioned ventilating scheme, adjustable vanes being sometimes employed to direct air flow in the most advantageous direction. A simplified example of this dual arrangement is used in the telephone kiosks of which there are over 100. In a neat example of mirror lighting the lamp and reflector are housed behind a semi-transparent panel in the mirror itself, through which the light is transmitted.

A design used widely is in the form of a ceiling fitting housing up to four fluorescent lamps. The exterior consists of a decorative fretted bronze frame to which is attached (but easily removed) a "Perspex" diffuser screening the lamps and interior. An internal reflector carries the control gear and the fitting is so constructed as to permit rapid detachment and replacement of gear and reflector as a whole.

Apart from their functional characteristics many of the fittings are also of great beauty and are designed in the Gothic style. Notable examples are the wall brackets and the hanging lanterns mainly for use in the Cloisters. Decorative tracery of the cast bronze panelling is backed by laminated glass lightly tinted and obscured to the extent necessary to give a pleasant diffusion of light.

In the more important rooms handsome table standards will be used, the pillars being made of carved oak and the hoods of bronze lined with anodized aluminium reflectors. Some of these standards are being presented by the Dominions and the donors' names are engraved on the hoods. The external metalwork of all designs is real bronze (mostly cast) and is polished a satin finish and left unlacquered. This arrangement obviates the necessity of the later refinishing.



**Bronze and "Perspex" ceiling fitting and (left) carved oak table standard with bronze hood**

Various decorative suspended type fittings are being made

by Osler & Faraday, Ltd. Seven feet high and weighing 5 cwt, the five main fittings for the Commons Lobby each accommodate ten 4 ft 40 W fluorescent tubes arranged vertically. Other fittings of different sizes taking from two to four lamps of from 2 ft to 4 ft in length will illuminate the Division Lobby, Speaker's Lobby, Clerk of the House Suite, Government and Opposition Whips' Rooms and other offices.

# Consulting Engineers

## *President of Board of Trade at Annual Dinner*

PROPOSING the toast of the "Association of Consulting Engineers," at the annual dinner in London on 25th May, Mr. Harold Wilson (President of the Board of Trade) referred to the part played by his hosts in the re-establishment of the position of Great Britain, which was built on an expanding economy and full employment.

Regarding exports, compared with pre-war conditions the volume of engineering exports was half as much again in 1947, had doubled in 1948, and was two and a quarter times as much in 1949. In pre-war years engineering was responsible for a third of the total exports; last year it accounted for a half.

Successes had been gained in a sellers' market, but with other countries, including Germany and Japan, needing to export, an expanding world economy with freer channels of trade was essential to future prosperity.

With world populations increasing by 18 millions a year, hundreds of millions of people aspired to higher standards of living, which hydro-electric power, for instance, would help to bring.

In its efforts to promote this country's interests abroad the Government valued the aid given by consulting engineers, especially in Canada. If their code of etiquette caused them to be less aggressive than corresponding representatives of other countries, they largely offset this by co-operative working and by personal visits (at some loss of attention to the home market) and by their high-class specifications.

Response was made by Mr. T. A. L. Paton (president) who referred to the energetic support received by consulting engineers from Mr. Wilson and officials of the Board of Trade and other Government Departments concerned and also from the Trade Commissioner in Canada. Although by their strict code of ethics (which must be retained) British consultants individually might not advertise, solicit work, or make a direct approach, they could do all these things collectively. So honest a calling, he said, was a religion which, though outwardly material, was inwardly based on a spirit of adventure and loyal co-operation. Colonel Lowe, their representative in Canada, had found that British manufacturers could compete with others provided deliveries were good. Unless consulting engineers had work at home, however, to train staff, they could not succeed overseas. Members of the Association were now concerned in work to the value of £40 million at home and £38 million overseas. Membership had increased by 35 to 303 during the past year (including firms in South Africa and Australia). Mr. Paton also referred appreciatively to the work of the secretary, Colonel Walker.

Replying on behalf of the guests, whose health had been proposed by Mr. J. A. Banks, Sir Cecil Weir (chairman, Dollar Exports Board) emphasized the need to get in at the planning stage in Canada. The aim should be to open more branch offices there and to send more young men to take posts in the United States and Canada for training as consultants. Such interchanges were common between those two countries, where it was recognized that, while British engineers knew their job, they were not always familiar with local conditions. Resident representatives were needed.

## Conditions in Christchurch

STATISTICS in the latest report of the Christchurch, New Zealand, Municipal Electricity Department, make interesting reading. Over the past forty-odd years the revenue per kWh sold has fallen with hardly a break to the record low level of 0.647d in in 1948-49. Of the Department's 41,000 domestic consumers more than half use electric cookers and water heaters (24,000 and 22,000 respectively). The big problem remains the power shortage.

Extremely dry weather has once again made the situation critical, and threatens to restrict industry to a four-day week. Completion of the Lake Tekapo project has been delayed not by delivery of plant from overseas (the bulk of it arrived last August) but by slow progress of the construction work at the site. The station is now scheduled for operation at the end of this year.

# Commerce and Industry

## Boiler Plant for Singapore
## Ironmongers and Discounts

A CONTRACT worth over £750,000 for powerhouse equipment for Singapore has been received by Babcock & Wilcox, Ltd., Renfrew. The order, which is a repeat of one placed by the Singapore municipal authorities in 1947, will take almost two years to complete. Two large boilers, each valued at £187,500, and a large quantity of piping and other equipment are required under the contract for Pasir Pajang.

### Contract Price Adjustment Formulae

The following are the latest figures for use in the B.E.A.M.A. contract price adjustment formulae. The rate of pay for adult male labour at 13th May is deemed to be 115s (unchanged). Costs of materials: the Board of Trade index figure for intermediate products as on 13th May is 277.9, and is the figure for April (against 278.1).

### Hoover Mobile Exhibition

In our last issue we drew attention to the mobile exhibition of Hoover, Ltd., which is to tour agricultural shows, rural institutes, etc., and last week we had the opportunity of inspecting the caravan trailers before they commenced their tour. The two trailers are set in juxtaposition to one another at an angle of 90 deg, forming a complete exhibition setting. There are facilities for complete demonstrations, an intake being provided for connecting up to local electricity supplies. One trailer will demonstrate Hoover washing machines and the equipment includes hot towel rails and a drying cabinet. The other trailer has been designed for the demonstration of electric cleaners. The two vehicles, when in position, are connected by a bridge on which there is a fractional h.p. motor display indicating some agricultural applications of the company's motors. The vehicles are towed by 2-ton Fordson vans which accommodate demonstration stocks and equipment and reserves of display material. The first show to be visited is the Bath and West Show now being held at Castle Bromwich, Birmingham.

**The Hoover Mobile Exhibition which is touring rural areas**

### Power Capacitors for Canada

A large consignment of power capacitors has recently been exported to Canada by British Insulated Callender's Cables, Ltd. The capacitors will be installed in the system of the Shawinigan Water and Power Co., Quebec Province. The complete order consisted of a 15,000 kVAr bank of capacitors for operation at 11 kV made up of sixty 250 kVAr units, which, under the conditions of the contract, were shipped in one consignment.

### Plant for New Zealand

The British Thomson-Houston Co., Ltd., Rugby, is to supply four 44,400 kVA, 11 kV a.c. generators of the vertical type to the State Hydro-Electric Department, Wellington, New Zealand, for the new Roxburgh power station in the South Island. Each generator will be driven at 136.5 r.p.m. by a 60,000 h.p. water-turbine which will be manufactured in Canada. The overall diameter of the machines will be about 30 ft

and the total weight 350 tons each, of which the rotor alone will weigh 180 tons. The B.T.H. Co., has obtained the contract through its representatives, the National Electrical & Engineering Co., New Zealand, in the face of world-wide competition, and will manufacture the generators and ancillary gear in the Rugby works. The value of this contract is over £500,000.

## Electrical Ironmongers

Presenting the report of the Electrical Section at the annual conference of the National Federation of Ironmongers, held recently at Harrogate, Mr. W. H. Ellerker said the cut in discounts on electrical fittings from 33⅓ to 25 per cent was a serious blow. Lighting fittings were almost as fragile as china and glass. At the moment, unfortunately, certain electrical organizations did not favour the Section, although they were prepared at time to make agreements with it. The Section had to be strengthened so that they could make a conjunction with the Electrical Contractors' Association. Electrical ironmongers must be in a position to supply the smaller electrician in just the same way as the builders' ironmonger supplied the builder.

## Water-heating Window Display

In the accompanying picture we show a water-heating display which has been arranged in the showroom window of Mortimer, Gall & Co., Ltd., electrical engineers and contractors, 115-117, Cannon Street, London, E.C.4. The display is primarily intended to encourage city offices to install electric water-heaters in staff cloakrooms and emphasis is laid on the economical aspect. A dial indicates the running cost in the staff cloakroom (used by ten people) of Mortimer, Gall, while a display card states that the daily average cost is 4d. A "Charlton" water-heater in cross-section, supplied by British National Electrics, Ltd., shows the construction of the interior.

**An electric water-heating display in the showroom window of Mortimer, Gall & Co.**

## Schoolgirls' Exhibition

The British Electrical Development Association is staging a display at the Schoolgirls' Exhibition which is being held at the Horticultural Hall, Westminster, from 24th May to 3rd June. Although at a casual glance, the display has the appearance of a "pin-table" saloon, it has a serious purpose—to teach the young visitors in easy stages how electricity does some of the many things for which it is now used in homes, shops, offices and factories. There is a vacuum cleaner constructed of transparent plastic, which the girls can switch on and see exactly what happens when they use one of these machines for cleaning their homes.

Another of the exhibits shows how the control switch of an electric cooker hot-plate works, varying degrees of illumination of the hot-plate being produced by turning the usual control knob. Other electrical appliances treated in this way are a washing machine and a refrigerator.

## Diesel Sets for Australia

Clark (1938), Ltd., Sunderland, have received an order from Sulzer Brothers, London, on behalf of the State Electricity Commission of Victoria, Australia, for six diesel electric generating sets for power stations at Warnambook and Shepparton, Australia. The Electric Construction Co., Ltd., will manufacture the alternators, switchgear and transformers.

## Scottish Cables Acquisition

Scottish Cables, Ltd., of Renfrew, announces the acquisition of a cable works at Pietermaritzburg, owned by Rhodesian Cables, Ltd.

## Firm Contracts

A move by the North of Scotland Hydro-Electric Board to check rising costs in building and civil engineering work was discussed by Banff County Council on 23rd May. The Board stated that it intended to let a number of important contracts in building and civil engineering works without any provision for price variations, either in materials or wages, and asked if the County Council was

**At the Electric Vehicle Association luncheon. Left to right: Mr. E. R. Wilkinson, Mr. V. W. Dale, Mr. P. Rochs, Lord Citrine and Mr. A. Barnes**

following the same procedure or would consider such action. The Board added that it had sent a similar communication to the Association of County Councils and the Convention of Royal Burghs. The County Council agreed that this move should be supported.

## British Equipment for Ontario

Details of the $100 million spent in 1949 by the Ontario Hydro-Electric Power Commission to meet the requirements of its construction and standardization programme were given recently by the chairman, Mr. R. H. Saunders. Of this total $86,750,000 went to Canadian firms and of the remainder more than $8,750,000 were spent in the United Kingdom. The balance of $4,500,000 was spent in the United States, largely for what the chairman described as emergency purchases, or for materials not available elsewhere.

## M.E.M. Handbook

The Midland Electric Manufacturing Co., Ltd., has issued the first post-war edition of its employees' handbook. The information includes particulars of canteen arrangements, the company's family allowance scheme, long-service awards, retirement benefit fund, etc. A section gives a brief history of the company from its foundation by Mr. W. L. Barber in 1908 to the present day. The booklet is liberally illustrated with photographs of the factory, canteen, sports field, etc. Supplements deal with conditions as they apply to works or staff employees.

## Electric Vehicle Association

At the annual general meeting of the Electric Vehicle Association of Great Britain Sir John Kennedy, the president, who was unable to attend through illness, was invited to continue in office for a further term. Mr. Peter Rochs (Austin Crompton Parkinson Electric Vehicles, Ltd.) was re-elected chairman for the third year in succession. He was thanked by members for his personal efforts in the Association's campaign for the exemption of the electric vehicle from the purchase tax recently imposed on commercial vehicles. Mr. R. Birt (Sub-Area liaison officer, Southern Electricity Board) was re-elected vice-chairman.

## Safety at Sea

More than 45,000 persons visited the "Safety at Sea" exhibition during the month in which it was held at the Charing Cross London Transport Station. This exhibition, which closed a week ago, was presented by the Marconi International Marine Communication Co., Ltd., in conjunction with the London Transport Executive. Over 1,000 inquiries for the positions of British merchant ships at sea were dealt with by the G.P.O. exhibit, which was in communication with Burnham Radio by land line.

## Manchester Electronics Exhibition

The fifth annual Electronics Exhibition organized by the Norht-Western Branch of the Institution of Electronics will be held at the College of Technology, Manchester, on 18th and 19th July. Part of the exhibition will be devoted to the interests of the amateur constructor and there will be demonstrations of television reception on receivers designed for home construction. Admission will be by ticket obtainable from Mr. A. Hickson, 205, Parrs Wood Road South, East Didsbury, Manchester 2.

## Zinc Prices

The price of good ordinary brand zinc was increased by £4 per ton delivered to £107 10s per ton on May 25, and this was followed on Monday last by a rise of a further £4 per ton to £111 10s.

## Southern Board Graduates

The second meeting of the Southern Electricity Board Graduate Association was held at Portsmouth on 16th May. Among those present were Dr. A. G. Beverstock, vice-president, Alderman J. P. D. Lacey, part-

time member of the Board and Mr. H. Robson, district manager, Portsmouth, who acted as host for the occasion. Mr. G. A. Raymond, of Oxford, was in the chair. A lecture was given by Mr. T. David, A.M.I.E.E., testing engineer for the B.I.C.C. Midland Area, the subject being "Fault Location on Underground Cables." Mr. K. F. Tee, of Portsmouth, was elected to succeed Mr. Raymond.

## Trade Announcements

**L. Power & Son,** of 340, Eastern Avenue, Ilford, Essex, have recently reopened their neon sign department.

The address of Mr. W. L. White, Southern Counties area manager for **Bill Switchgear, Ltd.,** is now, 94, Shakespeare Avenue, Bath (telephone: Bath 3423).

The Manchester office of the **Brush Electrical Engineering Co., Ltd.,** is moving on 6th June to Victoria Buildings, 32, Deansgate, Manchester, 3 (telephone: Blackfriars 4426/7).

## "Dimplex" Oil-filled Radiators

With regard to the reference on page 736 of our 12th May issue to the "Dimplex" oil-filled radiators, the manufacturers, Habin, Ltd., point out that, while all types of their radiators *can* be supplied with maximum temperature cut-outs only, thus making them suitable for a.c. and d.c. installation, the standard model of the "Dimplex" is fitted with a combined thermostat and excess temperature cut-out which makes the radiators suitable for a.c. only.

## Annual Holidays

The works of the General Accessories Co., Ltd., will be closed for the annual holiday from 28th July to 8th August.

## Industrial Supervisors

At a recent meeting of foremen at the College of Technology, Bristol, it was decided to form a Bristol Section of the Institute of Industrial Supervisors. The acting chairman is Mr. E. E. Weeks, and the acting section secretary is Mr. J. W. McVeigh, 24, Davis Street, Avonmouth, Bristol.

## Television for Canada

The first dollar-earning television contract for Britain has been won, in the face of keen international competition, by Marconi's Wireless Telegraph Co., Ltd. This contract (placed by the Canadian Broadcasting Corporation through the Canadian Marconi Co.) calls for the equipping, in both Toronto and Montreal, of two studios and control rooms, a master control room, and a film-projector room.

## Catalogues and Lists

**Evershed & Vignoles, Ltd.,** Acton Lane Works, Chiswick, London, W.4.—Technical brochure (No. 234) on "Noflote" pump controlling apparatus.

**Belling & Lee, Ltd.,** Cambridge Arterial Road, Enfield, Middlesex.—General catalogue of components and accessories for the radio and electrical industries.

**General Electric Co., Ltd.,** Magnet House, Kingsway, London, W.C.2.—Priced catalogue of table and bracket fans for use on either a.c. or d.c. mains.

**Electro Dynamic Construction Co., Ltd.,** St. Mary Cray, Kent.—Leaflet on miniature rotary transformers (30W to 60W) and high-frequency motor alternators (0.02 kW to 3 kW).

**Bowthorpe Electric Co., Ltd.,** Crawley, Sussex.—Brochure on the Bowthorpe system of wood pole preservation.

**Julius Sax & Co., Ltd.,** 24, Commerce Road, Brentford, Middlesex.—Priced catalogue electric bells, indicator equipment and electrical accessories.

**Hart Accumulator Co., Ltd.,** Stratford, London, E.15.—Catalogue of automatic emergency lighting equipments.

**Vactite Wire Co., Ltd.,** 75, Simon Street, Salford, 3, Lancs.—Catalogue of resistance wires and tapes.

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## British Association

PRELIMINARY details of this year's meeting at Birmingham of the British Association for the Advancement of Science (30th August to 6th September) are now available, together with registration forms, from the secretary at Burlington House, Piccadilly, London, W.1. Sir Harold Hartley, K.C.V.O., F.R.S., is the president, and his address at the inaugural meeting will be entitled "Man's Use of Energy." In section G—Engineering the discussions will cover among other things, automatic control systems and gas turbines.

In connection with the meeting a public exhibition is being arranged in the University at Edgbaston with the topic "Energy in the Service of Man," together with a series of five lectures, one of which will deal with the production and distribution of power. Two demonstration lectures on electrical subjects will also be given to children by Dr. Percy Dunsheath on Saturday, 2nd September, in the Digbeth Institute. The programme of tours, etc., will include visits to Walsall power station and a number of industrial establishments.

# FINANCIAL SECTION

## Company Notes and Stock Exchange Activities

### REPORTS AND DIVIDENDS

**Johnson & Phillips, Ltd.,** held their annual meeting on 25th May, when Mr. G. L. Wates (chairman and joint managing director), who presided, said that in common with other firms in their industry their order book in practically all departments was very much lighter than it was at the beginning of 1949, with the result that delivery times were much shorter. As to cables, for nearly all sizes and types they could give immediate delivery. Sales of their new B.N.E. cooker, "C.49," were satisfactory, but sales of water-heaters were crippled by purchase tax. Their export trade had maintained approximately the same proportion of the total as was the case in 1948—nearly 40 per cent, but the idea of self-sufficiency was growing throughout the world and in many countries it was becoming difficult to export, due to quotas, import licensing, tariffs or indigenous manufacture. Competition from Japan and Italy was growing, particularly in India, Pakistan and the Middle East, and there were signs of a resurgence of German competition. They had developed their local overseas factories and their factory at Driehoek, South Africa, was in production. Their factory in Karachi, equipped principally for the manufacture of switchgear, had been in production since last November. In Australia they had acquired land at Liverpool, near to the factory of Cable Makers Australia Pty., Ltd., and were now in process of erecting a factory there. A rapidly growing volume of orders was being obtained from both home and abroad for their aluminium-sheathed cable. The prospects of future demands were so bright that they were increasing their manufacturing capacity by installing a second plant, and by extending and improving the original plant. Continuous research and development was in progress at the laboratory, and they proposed to spend considerable sums in enlarging the existing facilities in their power cable factory at Charlton.

**The Telegraph Condenser Co., Ltd.**—Speaking at the annual general meeting held on 24th May, Mr. P. V. Hunter (chairman), said that the radio industry, from which they obtained a substantial portion of their business, had experienced a period of bad trading, but in spite of these adverse influences the turnover was only slightly lower than for the previous year. British Dielectric Research, Ltd., formed to undertake fundamental research on behalf of the company and associated interests, was now operating satisfactorily. During the first half of 1949 production was substantially in line with a reduced volume of incoming orders, but with the turn of the year the orders, both for home and overseas, increased rapidly and production had to be correspondingly geared up. The demand had continued at a high level in the meantime. Their industrial and general sales were maintained throughout the year at a satisfactory level and direct exports, which exceeded the total for 1948 by 40 per cent, constituted the highest figure in the history of the company.

**The Telephone & General Trust, Ltd.,** held its annual meeting on 23rd May when Sir Alexander Roger (chairman and managing director), who presided, said that of the Trust's total investments 64.45 per cent were in the British Commonwealth and 35.55 per cent in foreign countries. After reviewing the progress of the Anglo-Portuguese Telephone Co., the Nacional Telephone Co. of Venezuela and the telephone companies in Jamaica, Trinidad, Tobago and Barbados, in which the Trust has interests, Sir Alexander said that a continuous flow of new capital was essential for the expansion of these operating companies, and they were able to plan their development programmes well ahead in the knowledge that the initial finance would be provided by the Trust in the form of temporary loans.

**Laurence, Scott & Electromotors, Ltd.**—In the course of his speech at the annual meeting held on 24th May, Mr. G. H. Wilson (chairman and managing director) said that the year under review had been marked by a continuation of a high level of demand for the company's products. The total volume of orders on their books at the end of the year was substantially greater than at the beginning, in spite of the fact that they had again achieved a higher volume of production. This was due to the fact that their range of manufacture was so much wider than it used to be, and they were no longer vulnerable to any recession that might occur in any particular sphere. The variable-speed a.c. motor had opened up opportunities and applications which had greatly increased their sphere of operations and the success of this motor had been outstanding. There were also many other

directions in which their technical staff had enabled them to expand their range of operations, all of which tended to make them less dependent on any one particular branch of their industry.

**Cable & Wireless (Holding), Ltd.**—In his speech at the annual meeting held on 23rd May Sir Edward Wilshaw (chairman) said that the reconstruction scheme for all practical purposes was behind them and they could now settle down and concentrate on the administration of what would be the biggest investment trust company in the Empire—with an authorized capital of £47 million. The directors believed that the company, with its widespread interests in the investment field spread over many countries, could be of material assistance not only in those countries but to the business community, while at the same time securing a more generous return on the funds so employed.

**The Bankside Investment Trust, Ltd.,** a property company which owns, *inter alia,* buildings containing substations in the City formerly used by the City of London Electric Lighting Co., is to be wound up. The British Electricity Authority (which acquired the Trust) has decided that the Trust's activities are extraneous to the functions of the B.E.A. under the 1947 Electricity Act, and it proposes to dispose of the properties and repay the 5 per cent first mortgage debenture stock at 110 per cent.

**Siemens Brothers & Co., Ltd.,** report a group profit for 1949, after all charges, including taxation, of £514,759, as compared with £450,423 for 1948, to which is added £183,569 tax provisions of previous years not now required and release of over-provision for depreciation. The ordinary dividend for the year is maintained at 7½ per cent.

**The Anglo-Portuguese Telephone Co., Ltd.,** reports a net profit for 1949 of £61,032, as compared with £60,473 for 1948. It is proposed to pay a final ordinary dividend of 5 per cent, again making 8 per cent for the year, and to maintain the dividend on the "A" ordinary at 8 per cent.

**T. Clarke & Co., Ltd.,** report a net profit for 1949 of £15,707, as compared with £13,263 for 1948. It is proposed to pay a final dividend of 5 per cent, making 10 per cent for the year (unchanged), and to carry forward £448 (against £1,032 brought in).

**Lightfoot Refrigeration, Ltd.,** reports a trading profit for 1949 of £82,655, as compared with £84,143 for 1948. After deducting depreciation £14,026, and taxation £39,507, it is proposed to pay a final ordinary dividend of 5 per cent., making 8 per cent for the year (unchanged). The balance carried forward is £31,035 (against £35,316 brought in).

**The Atlas Electric & General Trust, Ltd.,** reports a net credit balance for the year ended 31st March last, after deducting all charges, including taxation, of £226,188, as compared with £217,158 for 1948-49. It is proposed to pay an ordinary dividend for the year of 3 per cent (against 2½ per cent).

**The Lisbon Electric Tramways, Ltd.,** reports a profit for 1949 of £65,306, as compared with £61,055 for 1948. The dividend for the year is maintained at 5 per cent, tax free, by a final payment of 2½ per cent.

**The Plessey Co., Ltd.,** has declared an interim dividend of 10 per cent (unchanged).

**Crompton Parkinson, Ltd.,** have declared an interim dividend of 3¾ per cent on the ordinary and "A" ordinary stock (against 7½ per cent), on capital doubled by a 100 per cent bonus issue.

**Vactric, Ltd.,** announce that the dividend on the 6 per cent cumulative preference shares due on 1st June, will not be paid.

## LIQUIDATIONS

**A. F. Olpin, Ltd.**—Winding up voluntarily. Liquidator, Mr. E. E. Burridge, 70, Park Street, Bristol.

**The Worth Electrical Services Co., Ltd.**—Meeting 1st July, at 29, Randall Road, Leatherhead, to receive an account of the winding-up by the liquidator, Mr. T. W. Hutt.

## BANKRUPTCIES

**E. Whittington,** carrying on business at Mona Villa Works, Clifton Lane, Rotherham, as Modern Electric Service, manufacturer and electrical engineer.—First and final dividend of 4s 8d in the £1, payable at 47, Mosley Street, Manchester, 2.

**S. I. Rae,** carrying on business at 1, Ashburton Road, Gosforth, electrical contractor.—Receiving order made 22nd May on debtor's own petition. First meeting 2nd June at 54, Westgate Road, Newcastle-on-Tyne. Public examination 11th July at the County Court, Newcastle-on-Tyne.

**C. F. Adams,** 93, Queens Road, Buckhurst Hill, Essex, lately carrying on business with another at 351, Forest Road, Walthamstow as Swift Bros., electrical engineers.—Order made 27th April suspending discharge for six months until 27th October, 1950.

**W. T. Spencer,** 376, Oldham Road, Newton Heath, Manchester, electrician.—Last day for receiving proofs for dividend 9th June. Trustee, Mr. F. C. Ormrod, 20, Byrom Street, Manchester, Official Receiver.

# FINANCIAL SECTION

# STOCKS and SHARES

STOCK EXCHANGE prices opened firmly after the Whitsun holiday. Before that, markets as a whole had been good, with gilt-edged securities again in good demand. Investment continues to seek the ordinary shares of companies whose dividend payments are well covered by earnings; companies, that is to say, similar to the 14 examples that were given in last week's issue on page 1077. The investors' interest is directed more especially to these because it is thought that when dividend limitation does come off, companies that show earnings well above the amounts distributed to their shareholders may be expected to step up the ordinary dividends at present paid.

## Telephone Trust Group

For dividend stability, not many investments can approach the record of Telephone & General Trust and the associated Anglo-Portuguese Telephone Company. Dividends of 8 per cent recently declared by each company are at the same rate as has been paid since, respectively, 1930 and 1927. Policy of the Trust, outlined by Sir Alexander Roger at last week's meeting, is to assist the operating companies' development by initial finance in the form of temporary loans, to be replaced in due course by permanent capital raised by the companies themselves. Accordingly, plans are in hand for an issue by Anglo-Portuguese Telephone to take the place of the £768,000 at present on loan from the Trust. Anglo-Portuguese Telephone ordinary shares stand at 25s 6d, to yield 6¼ per cent; and the Trust's shares at 29s return 5½ per cent.

## Company News

Cable shares are in the news with the report of much sterner conditions in the industry as reviewed by the chairman of Johnson & Phillips at the meeting; and with the Siemens Bros.' preliminary profits statement. Both companies reported profits for 1949 at around the previous year's level. An improvement of £64,000 in Siemens' group profit, after tax, is covered nearly by a similar reduction in the tax provision, so that trading profits would appear to have been rather more than maintained. Payment of the regular 7½ per cent dividend leaves £130,000 for reserves. Elsewhere, Vactric 6 per cent preference were quoted at 15s at the time of the decision to pass the due dividend, which is in arrears from the end of 1947.

## Plessey Company

Last week's declaration of a 10 per cent interim dividend (as before) by the Plessey Company draws attention to recent activity in the 5s ordinary shares. Officially quoted now at 16s 3d, they have changed hands lately up to 18s, having been down to 14s. 3d earlier in the year. According to the market, revival dates from the Radio and Electronic Components exhibition in April. This displayed the extent of the company's business in a field of particular interest at present to investors wanting a stake in the future of television. Since the company was made public in 1937, there has been a succession of 20 per cent dividends, varied only by increases on two occasions. The directors say that earnings for the period now ending are likely to be somewhat lower than last year's.

## Cable and Wireless New Stock

As expected, the new 4 per cent ten-year loan created by the Cable & Wireless reconstruction, and offered at the price of 96 as one of the former preference stockholders' options, is proving a popular security. Active dealings are in progress at about 100⅜.

Cable & Wireless new ordinary stock, on which the chairman forecasts a 5 per cent dividend, hardened to 93¼ after being down to 91. The 3 per cent 3½-year unsecured loan stock is quoted at 100.

## Shares and Yields

Comparatively high yields persist on Brush Electric issues, and are well secured on the basis of the 1949 results published earlier this month. The 5s ordinary stand at 6s 9d middle. The yield at this price works out to £7 8s 2d per cent on a 10 per cent dividend, paid from distributable earnings equivalent to 66 per cent on the issued capital. The 5½ per cent preference, available at 20s 6d, pay about 5⅜ per cent on the money, with the dividend covered some twenty times by last year's profits. Another high-yielding 5½ per cent stock is available in E. K. Cole preference at 18s 9d, the return being £5 17s 3d per cent. This company's 7 per cent preferred stock is quoted about 25s, which gives a return of 8 per cent, allowing for the extra 3 per cent payment in which the stock has participated for many years. The 5s ordinary at 16s 3d pay £6 3s per cent with a 20 per cent dividend.

# Electrical Investments

## *Past Month's Price Changes*

| Company | Dividend Previous | Dividend Last | Middle Price 26 May 1950 | Month's Rise or Fall | Yield p.c. |
|---|---|---|---|---|---|
| *Overseas Electricity Companies* | | | | £ s. d. | |
| Atlas Elec. ... | 2 | 2½ | 14/3 | — | 3 10 2 |
| Calcutta Elec. ... | 6† | 6† | 24/- | +6d. | 5 0 0 |
| Cawnpore Elec. ... | 13 | 10 | 47/6 | −½ | 4 4 3 |
| East African Power | 7 | 7 | 34/9 | — | 4 0 7 |
| Jerusalem Elec. ... | 5 | 6 | 13/- | −3d. | — |
| Madras Elec. ... | 8 | 5 | 30/- | — | 3 6 8 |
| Nigerian Elec. ... | 10 | 10 | 30/9 | +9d. | 6 19 1 |
| Palestine Elec. "A" | Nil | 5† | 22/6 | — | 4 9 0 |
| Perak Hydro-Elec. | Nil | Nil | 9/- | +1/- | — |
| Whitehall Inv. Pref. | — | 6 | 23/6 | — | 5 4 4 |
| *Equipment and Manufacturing* | | | | | |
| Aberdare Cables ... | 15 | 20 | 57/6 | — | 6 19 0 |
| Aron Elec. Ord. ... | 15 | 15 | 35/- | +6/3 | 8 11 6 |
| Assoc. Elec. Ord. ... | 15 | 15 | 73/9 | +1/6 | 4 1 4 |
| Automatic Tel. & El. | 12½ | 12½ | 58/9 | +1/9 | 4 5 0 |
| Babcock & Wilcox | 15 | 15 | 60/- | +1/9 | 5 0 0 |
| Baldwin, H. J (2/-) | 25 | 25 | 5/9 | +1/- | 8 13 10 |
| British Aluminium | 10 | 10 | 39/- | −6d. | 5 2 7 |
| B.I. Callender's ... | 6⅜ | 6⅜ | 33/3 | +1/9 | 4 0 9 |
| British Thermostat (5/-) ... ... | 25 | 30 | 26/3 | +1/9 | 5 14 3 |
| British Vac. Cleaner (5/-) ... ... | 20 | 20 | 11/6 | +6d. | 8 13 10 |
| Brush Ord. (5/-) ... | 10 | 10 | 6/9 | +9d. | 7 8 2 |
| Burco (5/-) ... | 35 | 35 | 20/9 | +9d. | 8 8 8 |
| Chloride El. Storage | 20 | 12½ | 49/6 | +2/6 | 4 1 0‡ |
| Cole, E. K. (5/-) ... | 22½ | 20 | 16/3 | — | 6 3 1 |
| Cossor, A. C. (5/-)... | Nil | Nil | 8/6 | — | — |
| Crabtree (10/-) ... | 17½ | 17½ | 35/- | +1/- | 5 0 0 |
| Crompton Parkinson Ord. (5/-) ... | 22½ | 22½ | 12/- | +1/- | 4 13 9 |
| De La Rue (5/-) ... | 50 | 50 | 23/3 | +3/9 | 10 15 0 |
| Decca (1/-) ... | 112½ | 112½ | 15/9 | +2/9 | 7 3 0 |
| E.M.I. (10/-) ... | 8 | 8 | 25/- | −6d. | 3 4 0 |
| Electrical Components (5/-) ... | 20 | 20 | 11/3 | +6d. | 8 17 10 |
| Elec. Construction | 12½ | 12½ | 47/- | — | 5 6 5 |
| Enfield Cable Ord. | 7½ | 7½ | 32/6 | +6d. | 4 12 4 |
| English Electric ... | 10 | 10 | 44/6 | +2/6 | 4 10 0 |
| Ericsson Tel. (5/-)... | 20† | 20† | 46/3 | +6d. | 2 3 3 |
| Ever Ready (5/-) | 40 | 35 | 27/- | −4/- | 6 9 8 |
| Falk Stadelmann ... | 15 | 15 | 36/3 | −⅛ | 8 5 6 |
| G.E.C. Ord ... | 17½ | 17½ | 77/6 | +⅛ | 4 10 2 |
| General Cables (5/-) | 50 | 50 | 16/3 | — | 9 4 8‡ |
| Greenwood & Batley | 15 | 15 | 38/3 | — | 7 16 10 |
| Hackbridge Cable (5/-) ... ... | — | 20 | 12/- | — | 8 6 8 |
| Hackbridge Hewittic (5/-) ... ... | 12 | 12½ | 12/6 | — | 5 0 0 |
| Hall Tel. Acc. (10/-) | 10 | 10 | 14/- | −6d. | 7 2 10 |
| Heatrae (2/-) ... | 12½ | 12½ | 4/- | — | 6 5 0 |
| Henleys (5/-) ... | 20 | 20 | 22/6 | — | 4 9 0 |
| Hoover (5/-) ... | 40 | 45 | 40/9 | +2/3 | 5 10 0 |
| Int!. Combustion (5/-) ... ... | 37½ | 37½ | 15/- | — | 5 0 0‡ |
| Johnson & Phillips | 15 | 15 | 61/3 | — | 4 17 10 |

| Company | Dividend Previous | Dividend Last | Middle Price 26 May 1950 | Month's Rise or Fall | Yie'd p.c. |
|---|---|---|---|---|---|
| *Equipment and Manufacturing (continued)* | | | | £ s. d. | |
| Lancashire Dynamo ... | 22½ | 22½ | 95/- | +2/6 | 4 14 7 |
| Laurence, Scott (5/-) | 12½ | 12½ | 13/6 | +3d. | 4 12 7 |
| London Elec. Wire | 10 | 10 | 46/3 | — | 4 6 7 |
| J. Lucas ... ... | 17½ | 17½ | 27/- | +6d. | 4 6 8‡ |
| Mather & Platt ... | 11 | 11 | 53/3 | +4/9 | 4 2 8 |
| Metal Industries ... | 10 | 10 | 40/9 | +9d. | 4 18 3 |
| Mid. Elec. Mfg. ... | 35 | 12½ | 53/9 | — | 4 13 0 |
| Murex ... ... | 20 | 20 | 45/- | +6d. | 4 9 0‡ |
| Newman Ind. (2/-) | 17½ | 10 | 3/- | — | 6 13 4 |
| Oldham & Son (1/-) | 60 | 60 | 5/6 | — | 5 10 0‡ |
| Plessey (5/-) ... | 20 | 20 | 16/3 | | 6 3 0 |
| Parsons C. A. ... | 12½ | 15 | 65/- | — | 4 11 9 |
| Pye Deferred (5/-) | 25 | 25 | 32/6 | +⅛ | 3 17 0 |
| Radio & Tel. (2/-) | Nil | 25 | 9d. | — | — |
| Revo (10/-) ... | 27½ | 27½ | 43/- | — | 6 8 0 |
| Reyrolle ... ... | 12½ | 15 | 66/3 | +⅛ | 4 10 4 |
| Scophony Baird (1/-) | — | — | 2/6 | −6d. | — |
| Scot. Cable (4/-) ... | 30 | 30 | 23/- | — | 5 4 4 |
| Siemens Ord. ... | 7½ | 7½ | 31/3 | — | 4 16 0 |
| Switchgear & Cowans (5/-) ... ... | 20 | 20 | 15/- | — | 6 13 4 |
| T.C.C. (10/-) ... | 15 | 15 | 33/9 | — | 4 8 9 |
| T.C. & M. ... | 10 | 9 | 37/- | +9d. | 4 6 6‡ |
| Telephone Mfg. (5/-) | 9 | 9 | 9/6 | +3d. | 4 14 9 |
| Thorn Elec. (5/-) ... | 25 | 20 | 16/3 | — | 6 3 1 |
| Tube Investments | 25 | 25 | 6½ | +⅜ | 4 1 6 |
| Vactric (5/-) ... | Nil | Nil | 7/6 | — | — |
| Veritys (5/-) ... | 5 | 5 | 3/6 | — | 7 2 10 |
| Walsall Conduits (4/-) ... ... | 70 | 70 | 55/- | +⅛ | 5 0 10 |
| Ward & Goldstone (5/-) ... ... | 50 | 50 | 35/- | — | 5 14 3‡ |
| Watford (2/-) ... | 20 | 20 | 6/- | — | 6 13 4 |
| Westinghouse Brake | 14 | 14 | 56/3 | +⅛ | 4 19 8 |
| West, Allen (5/-) ... | 10 | 10 | 8/9 | +9d. | 5 14 3 |
| *Transport and Communications* | | | | | |
| Anglo-Am. Tel: Pref. ... ... | 6 | 5 13/20 | 100½ | +3 | 5 12 3 |
| Def. ... ... | — | — | 20 | +2½ | — |
| Anglo-Portuguese | 8 | 8 | 25/6 | — | 6 5 6 |
| Brit. Elec. Traction: Def. Ord. ... | 50 | 50 | 450 | +30 | 3 16 0‡ |
| Calcutta Trams ... | Nil | 6† | 27/6 | +¼ | 4 7 3 |
| Cape Elec. Trams | 6 | 6 | 18/- | −6d. | — |
| Cable & Wireless: Ord. ... ... | — | — | 93 | — | — |
| 4% Loan ... | — | — | 100½ | — | 3 19 7 |
| Globe Tel. & Tel. Ord. | 5† | 5† | 45/- | +⅛ | — |
| Great Northern Tel. (£10) ... ... | 11 | 7 | 14½ | −½ | 4 18 3 |
| Inter. Tel. & Tel. ... | Nil | Nil | 27½ | −3½ | — |
| Marconi Marine ... | 7½ | 7½ | 25/9 | +6d. | 5 16 6 |
| Oriental Tel. Ord. | 10 | 16 | 45/- | −⅛ | 7 2 2 |
| Telephone Props. ... | 6 | 6 | 17/6 | −⅛ | 6 17 2 |
| Tele. Rentals (5/-) | 10 | 10 | 10/6 | — | 4 15 3 |

† Dividends are paid free of Income Tax.

‡ Yield adjusted to capital bonus issue.

# ELECTRICITY SUPPLY

## North Tees and Drakelow Contracts
## Welsh Reinforcement Scheme

THE British Electricity Authority has placed a contract valued at over £1,375,000 with Sir Robert McAlpine & Sons (Newcastle-upon-Tyne), Ltd., for piling and foundations for buildings and circulating water culverts as well as for an accommodation bridge, roads and railways for the new North Tees "C" power station. The present "A" and "B" stations have an installed capacity of 110,000 kW and that of the new "C" station will be 240,000 kW.

A contract valued at over £550,000 has also been placed with Sir Robert McAlpine & Sons (Midlands), Ltd., for main railway sidings and preliminary works, sewage disposal and reinforced concrete works for the new Drakelow power station, near Burton-on-Trent. This station when completed will also have a total installed capacity of 240,000 kW.

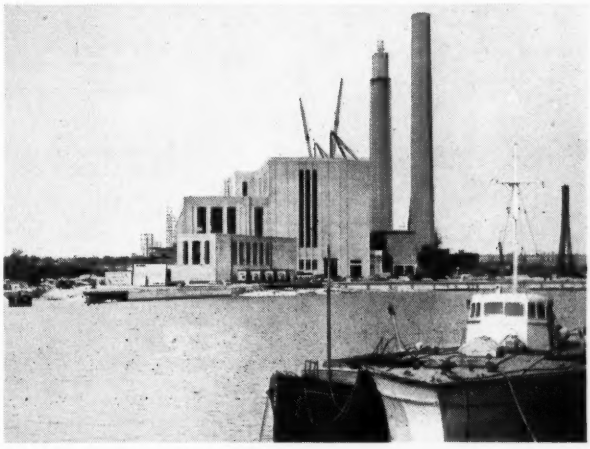
### *Welsh Developments*

The supply to North-West Wales is to be reinforced by the construction of 48 miles of 132 kV double circuit line from Hawarden to Dolgarrog and Bangor and the installation of transformers at all three places. Additional points of supply to the distribution system of the Merseyside and North Wales Electricity Board will thus be provided at Dolgarrog and Bangor. A further scheme of reinforcement is to be undertaken at Crewe where the installation of additional transformer capacity will enable the Area Board to take a greater supply at this point. It is expected that the whole of this work will be completed late in 1953.

Mr. A. R. Cooper, controller of the Merseyside & North Wales Division, explained the main features of the British Electricity Authority's proposals for the development of hydro-electric power in North Wales and answered questions at the morning session of the Consultative Council's meeting at Llandudno last week. The Council passed a resolution supporting the scheme. At the afternoon session, the chairman of the Merseyside & North Wales Electricity Board, Mr. J. Eccles, spoke about development in North Wales from the point of view of the distribution of electricity.

### *House Services*

An offer by the North of Scotland Hydro-Electric Board to provide service cables free of charge to housing estates where electricity is used for cooking purposes, was discussed by Aberdeenshire Housing Committee last week. The Board made the proviso that this offer would not apply where distribution costs were exceptionally high. The county architect pointed out that in the



**The new power station at Poole. Built on reclaimed mudland it occupies an area of about 30 acres at Holes Bay, and will have an ultimate capacity of 200 MW. The first section is expected to be in commission by the end of the year**

case of the Bankhead fourth development scheme of 44 houses the Board had said that if the supply were to be taken for lighting and small appliances only, the charge of laying the service would be £910. The county architect considered that in view of the saving, electricity only should be provided. The general feeling, however, was that the tenants should have the choice and it was thought that a compromise might be reached with the Board.

Gateshead Town Council, which recently decided that houses on the Wrekenton housing site should be equipped with both gas and electricity mains, has been informed that the North Eastern Electricity Board is not prepared to install cables and equip substations without knowing the number of houses to be all-electric. The Council has decided that electricity should be installed only for lighting, immersion heaters and one plug. Cooking and washing will be done by gas. A previous motion that tenants of Council houses on the estate should have a choice of either gas or electricity for cooking and washing has been rescinded.

## *Generating Plant Extensions*

The B.E.A. has received the consent of the Minister of Fuel and Power to the establishment of a new power station at Connah's Quay, Flint. The first section will comprise two 30,000 kW turbo-alternator sets, two 300,000lb/hr boilers and one cooling tower. When fully built, the station will have an installed capacity of 180,000 kW. Consent has also been obtained for an extension consisting of one 15,000 kW turbo-alternator at Bonnybridge power station, Stirling. It will raise the installed capacity of this station to 80,940 kW.

## *Ince Power Station*

The design of the Ince power station (Merseyside and North Wales Division) is to proceed on the basis of a semi-outdoor layout.

## *Tunnel Completed*

Miss J. Williamson, daughter of the consulting engineer for the Loch Sloy scheme, pressed the switch to fire the last charge which completed the Glen Falloch tunnel at the head of Loch Lomond. The tunnel, one of the highest in the Loch Sloy scheme, is 14,000ft long and 7ft in diameter.

## *Scottish Power Prospects*

Mr. Tom Johnson, chairman of the North of Scotland Hydro-Electric Board, predicted in Aberdeen on 23rd May that it would not be many years before Scotland was more or less self-supporting in the matter of electric power. He was speaking at the Music Hall, where an all-electric exhibition was opened by the Lady Provost. He pointed out that Aberdeen had a great opportunity to make more use of electrical power in home and industry to preserve the cleanliness of its granite dwellings.

## *Rural Supply Costs*

The Midlands Electricity Consultative Council at its last meeting discussed electricity connection charges in rural areas. Mr. T. C. Morgan (Shropshire and Herefordshire) said that a national scale of charges had been under the consideration of the appropriate committee practically since vesting date. As an interim measure, to secure terms more acceptable to rural consumers, he moved that the Midlands Electricity Board should adopt a scale based upon the size of the farm or premises to be connected.

Mr. E. G. Johnson (Central Gloucestershire) thought that in view of the possibility of an early announcement from the tariff sub-committee the present was not the right homent to raise the matter.

It was decided not to vote on the resolution but to forward it to the Board for consideration as a suggestion.

## *Electricity in Schools*

The L.C.C. Education Committee proposes to invite tenders for electrical installations in ten primary and secondary schools and one special school in the third group and ten primary and secondary schools in the fourth group of the fourth programme for the installation of electricity in schools. The estimated cost and incidence of the expenditure is as follows. It is also proposed to draw up a fifth programme of about 52 schools, on which work will be started at the rate of one school a week, beginning in January, 1951.

| | 1949–50 | 1950–51 | 1951–52 | Total |
|---|---|---|---|---|
| | £ | £ | £ | £ |
| Third Group | 250 | 27,500 | 5,250 | 33,000 |
| Fourth Group | — | 25,000 | 7,300 | 32,300 |

It has been reported to the Newcastle-on-Tyne Education Committee that a scheme for installing electricity, in place of gas, in eight local schools will cost £17,500 compared with the original estimate of £10,883. A supplementary estimate to cover the increase is to be provided.

## *House Installations*

Gateshead Town Council has approved in principle the installation of electricity in 37 houses, at present served only by gas, in Coulthard's Lane, Gateshead.

# NEW PATENTS

## Electrical Specifications Recently Published

*The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (2s each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.*

### 1942

6527. Stevens, A. H. (Board of Trustees of Leland Stanford Junior University). — Electronic oscillator-detector devices for the detection of distant objects. 13th May, 1942. (Convention date not granted.) (639981/4.)

### 1944

11003. British Thomson-Houston Co., Ltd.—Starting means for electric-discharge devices. 8th June, 1944. (Addition to 567613.) (640081.)

19538. Sperry Gyroscope Co., Inc.—High-frequency control systems. 10th October, 1944. (640221.)

### 1945

1235. British Thomson-Houston Co., Ltd.—Methods of forming coatings or films on supports. 15th January, 1945. (640222.)

28806. Telefonaktiebolaget L. M. Ericsson.—Regulating device for electro-magnetically driven vibratory pendulums. 30th October, 1945. (639985.)

32791. Stratton, A.—Oscillatory electric detector or measuring circuits or systems. 23rd July, 1947. (640084.)

### 1946

3494. Philco Radio & Television Corporation.—Electrical control systems, particularly systems applicable to the synchronization of oscillators, and detectors of frequency or phase modulation. 4th February, 1946. (639922.)

11526. British Thomson-Houston Co., Ltd.—Ultra-high-frequency wavemeters. 15th April, 1946. (640089.)

16790. Philco Products, Inc.—Television receiver. 3rd June, 1946. (639926.)

18989. British Thomson-Houston Co., Ltd., and Wellings, J. G.—Current transformers. 22nd January, 1948. (640144.)

21190. Helliar, C.—Apparatus for reactivating radio tubes. 15th July, 1946. (640225.)

24917. Metropolitan-Vickers Electrical Co., Ltd., Scoles, G. J., and Miller, C. W.—Electrical calculating circuits. 21st August, 1947. (639928.)

34685. Etablissements Merlin & Gerin.—Gas-blast electric switches with spark-absorbing impedances. 22nd November, 1946. (639930.)

38136. Philips Lamps, Ltd.—Magnetic deflection systems for cathode-ray tubes. 31st December, 1946. (640153.)

### 1947

269. Metropolitan-Vickers Electrical Co., Ltd., Dodds, J. M., and Whalley, H.—Control apparatus for cathode-ray tubes. 2nd January, 1948. (639991.)

381. Mortsell, A. M., and Ohlin, P.—Electrical torque-measuring devices. 6th January, 1947. (Convention date not granted.) (640238.)

463. Soc. Anon pour les Applications de l'Electricité et des Gaz Rares Etablissements Claude-Paz & Silva.—Electric-discharge switches. 6th January, 1947. (639993.)

1627. Standard Telephones & Cables, Ltd.—Electron-discharge devices. 17th January, 1947. (640239.)

1849. Sommer, A. H.—Formation of electrodes sensitized to be emitters of photo-electrons or secondary electrons. (20th December, 1947. (639995.)

3921. Vichnievsky, R.—Cathode-ray manograph for recording pressure variations in the cylinders of engines. 11th February, 1947. (Convention date not granted.) (640154.)

5023. Brown, R. H.—Pulsed radar systems. 15th March, 1948. (640000.)

5721. Stivin, J.—Electronic-discharge devices. 27th February 1947. (640155.)

5842. British Thomson-Houston Co., Ltd., and Beeston, E. J. G.—Circuit-arrangements for operating electric-discharge lamps. 24th August, 1948. (640156.)

5844. British Thomson-Houston Co., Ltd.—Automatic control mechanisms for initiating and timing a number of processes. 28th February, 1947. (640003.)

6048. Bendix Aviation Corporation. — Switching system. 3rd March, 1947. (640157.)

6174. Thomas, D. G. A.—Coincidence circuits. 5th April, 1948. (640005.)

6823. Ferguson Radio Corporation, Ltd., and Clark, R. G.—Circuits for separating electric oscillations of different frequencies. 8th March, 1948. (640007.)

7332. Metropolitan-Vickers Electrical Co., Ltd., and Higham, E. H.—Time base circuits. 29th January, 1948. (640160.)

13282. Wayne Kerr Laboratories, Ltd., and Calvert, R.—Radio navigation systems. 14th May, 1948. (640012.)

14934. British Telecommunications Research, Ltd., and Bell, D. A.—Apparatus for compressing or expanding the frequency bands of electric oscillations. 1st June, 1948. (640015.)

15207. Philips Lamps, Ltd.—Electrical apparatus comprising a wiring system produced by a high-pressure die-casting process. 10th June, 1947. (640016.)

15363. Triggs, W. W. (Caterpillar Tractor Co.).—Cable-laying sheaves. 11th June, 1947. (639936.)

18055. British Thomson-Houston Co., Ltd.—Transmitting and receiving equipment. 8th July, 1947. (640021.)

19307. Westinghouse Electric International Co.—Supply and control of electric power by means of discharge apparatus. 18th July, 1947. (640026.)

20294. General Electric Co., Ltd., and Judd, S. R.—D.c. supply circuits of the kind including controlled a.c./d.c. convertors. 28th July, 1948. (640029.)

20346. Bendix Aviation Corporation.—Trigger circuits using electron-discharge tubes. 28th July, 1947. (640030.)

20438. Bendix Aviation Corporation. — Electric measuring circuit. 29th July, 1947. (640031.)

21770. Western Electric Co., Inc.—Telephone systems. 7th August, 1947. (640032/3.)

22105. United Insulator Co., Ltd., and Chlumecky-Bauer, A. J. P.—Arrangement of tuned electric circuit elements. 6th August, 1948. (640034.)

23447. Aughtie, F.—Electrical computing devices. 25th August, 1948. (640176.)

23768. Sangamo Weston, Ltd.—Electrical measuring instruments. 27th August, 1947. (639948.)

25887. Marconi's Wireless Telegraph Co., Ltd.—Ultra-high-frequency wave transmission systems. 23rd September, 1947. (640181.)

26880. Simplex Electric Co., Ltd., and Dalziel, T.—Snap-action electric switches. 7th October, 1948. (640097.)

27264. General Electric Co., Ltd., Evans, J. I. G., and Fairbairn, E. P.—Radio communication systems and apparatus therefor. 17th September, 1948. (639954.)

27691. Swain, F. E., and Nicholson, S. G.—Rotary pumps or motors. 2nd June, 1948. (640098.)

28292. Philips Electrical, Ltd.—Circuit-arrangements for tone-control in low-frequency amplifiers. 22nd October, 1947. (640184.)

28479. Standard Telephones & Cables, Ltd., and Ransom, D. H.—Receiving equipment for pulse modu-

lation communication systems. 22nd October, 1948. (640099.)

28991. Cinema-Television, Ltd., and Jesty, L. C.—Apparatus for recording television and like pictures on kinematographic film. 30th September, 1948. (640186.)

29589. Akt.-Ges. Brown Boveri & Cie.—Determination of electric-discharges. 6th November, 1947. (640188.)

30545. Mole-Richardson (England), Ltd., and Hallett, C. G. H.—High-powered electric light source installations. 1st November, 1948. (640190.)

32034. Standard Telephones & Cables, Ltd., Starr, A. T., and Brewster, A. E.—Phase-multiplying transformers. 3rd December, 1948. (640100.)

32365. Goggins, P. J.—Electric iron. 8th December, 1947. (640051.)

33623. Standard Telephones & Cables, Ltd.—Alternating-current buzzers. 19th December, 1947. (640193.)

34563. Rosenberg, W., and Buckingham, J.—Electromagnetic wave-guides. 30th December, 1947. (640057.)

## 1948

1317. British Thomson-Houston Co., Ltd.—Synthetic elastic and elastomeric products. 15th January, 1948. (640067.)

1954. Rotax, Ltd., and Hamilton, R. F. G.—Alternating-current generating systems. 18th January, 1949. (640102.)

2180. Watts, C. E.—Apparatus for sound reproduction. 23rd February, 1949. (640068.)

2842. Hoover, Ltd.—Electric toasters. 30th January, 1948. (640072.)

4373. General Motors Corporation. — Refrigeration apparatus. 14th February, 1948. (640076.)

4536. Thermega, Ltd., and Swindells, V. E.—Apparatus for controlling the supply of electric current to the heating element of an electrically heated device. 16th February, 1949. (640106.)

5240. Everett, Edgcumbe & Co., Ltd., and Gruchy, J. N. de.—Electric battery charge indicator. 19th November, 1948. (640207.)

5308. Telephone & Electrical Industries Pty., Ltd.—Selector banks for automatic telephone systems. 23rd February, 1948. (64110.)

8294. Ritter Co., Inc.—Control of electric motors. 19th March, 1948. (640116.)

8298. General Electric Co., Ltd., and Hill, R. T. J.—Electronic distributors. 25th February, 1949. (640209.)

8392. Automatic Coil Winder & Electrical Equipment Co., Ltd., and Macadie, H. S.—Light meters. 10th March, 1949. (640117.)

8747. English Electric Co., Ltd., and Lloyd, R. A.—Mounting of an electrical apparatus case on a support member. 25th March, 1949. (640118.)

8806. Siemens Bros. & Co., Ltd., Ford, W. J., Gachet, E. J., and Popham, R. G.—Panels for automatic telephone switches. 25th March, 1949. (640211.)

9507. Philips Electrical, Ltd. — Superheterodyne radio receiving apparatus. 5th April, 1948. (639966.)

10472. Allmanna Svenska Elektriska Aktiebolaget.—High voltage dry valve plate apparatus. 15th April, 1948. (640212.)

12983. Compagnie de Produits Chimiques et Electro-Metallurgiques Alais, Froges & Carmague.—Electrolytic cells for the electrolysis of aqueous solutions. 12th May, 1948. (640126.)

6421. Seulen, G. W.—Split inductors for the heat-treatment of steel shafts and other articles by electromagnetic induction. 15th June, 1949. (639978.)

19759. British Thomson-Houston Co., Ltd., and Jones, K. M.—High voltage electrical apparatus. 13th July, 1949. (640137.)

20172. Victor Products (Wallsend), Ltd., and Wiles, R. C.—Plug-and-socket connectors for electric cables. 28th July, 1949. (639979.)

25417. Sangamo Weston, Ltd.—Electrical measuring apparatus. 29th September, 1948. (640220.)

29186. Electrolux, Ltd.—Cold-producing members of refrigerator cabinets. 10th November, 1948. (640139.)

## 1949

7633. Philips Electrical, Ltd. — Electric-discharge tubes with built-in condensers. 18th December, 1946. (Divided out of 628839.) (640080.)

# PUBLIC LIGHTING

THE Roads Committee of the RHONDDA Urban District Council recently visited Cardiff on the invitation of Mr. A. J. Channing, Sub-Area manager, South Wales Electricity Board, to inspect various schemes of street lighting in the city to enable them to recommend to the Council the most efficient method of lighting the main roads by electricity.

HINCKLEY Public Lighting Committee has recommended acceptance of an offer by the East Midlands Electricity Board to provide an experimental installation of sodium lighting in Station Road.

GATESHEAD Town Council has submitted to the Ministry of Health a £2,660 scheme for the provision of electric street lighting at the Wrekenton neighbourhood unit.

Street lighting is to be converted from gas to electricity at SPALDING, and the Urban District Council's share of the cost is estimated at £4,600.

A contract has been placed with Siemens Electric Lamps & Supplies, Ltd., for the supply and erection of fluorescent street lighting units at NEWTOWNARDS, Northern Ireland. These include 182 "Wilton Sieray" 3-80 fluorescent lanterns.

In the Chilterns Sub-Area of the Eastern Electricity Board a "Rythmatic" control unit has been installed at the Beecroft estate, DUNSTABLE, and is now in operation in connection with twenty street lamps on that estate. This is the first stage towards automatic control of street lighting in the Luton district.

QUORN, Leics, Parish Council is to communicate with the East Midlands Electricity Board regarding the possibility of converting street lighting from gas to electricity.

Asked to make a comprehensive survey of street lighting in GRANGEMOUTH, the burgh engineer has suggested that all gas lamps should be replaced to electric lamps. At present there are 480 gas lamps and 48 electric.

The STREATHAM and STAINTON Parish Council, Co. Durham, has decided to enter into an agreement with the North Eastern Electricity Board for the installation of street lighting at Stainton.

PETERBOROUGH City Council has instructed the city engineer to prepare a scheme for the improvement of street lighting in Fulbridge Road from St. Pauls Road to Paston roundabout.

DARLINGTON Corporation has received consent to the borrowing of the sum of £6,287 for electric street lighting in Coniscliffe Road, between Stanhope Road and the borough boundary.

# CONTRACT INFORMATION

## Accepted Tenders and Prospective Electrical Work

## CONTRACTS OPEN

*Where "Contracts Open" are advertised in our "Official Notices" section, the date of the issue is given in parentheses.*

**Australia.**—VICTORIA.—2nd August. State Electricity Commission. Belt conveyor system, open cut to briquette factory, Morwell. (See 26th May issue.)

**Bath.**—Hospital Management Committee. Electrical installation in the new operating theatre block at the Royal United Hospital. (See this issue.)

**Belfast.**—23rd June. Electricity Department. 33 kV oil-immersed reactor. (See this issue.)

**Bury.**—12th June. Town Council. Renewal of electrical installation at Market Hall; also electrical installation in connection with the erection of Elton Nursery School. Borough engineer, Town Hall.

**Edinburgh.**—30th June. North of Scotland Hydro-Electric Board. 33 kV, 11 kV and l.v. overhead distribution lines. (See 26th May issue.)

**Glossop.**—19th June. Corporation. Electric lighting, stage lighting and ventilation at Victoria Hall. (See 26th May.)

**Herefordshire.**—10th July. County Education Committee. Electrical installation at new secondary school, Ross-on-Wye. (See this issue.)

**Manchester.**—9th June. City Council. Rewiring Margaret Barclay Residential School for Crippled Children, Mobberley Hall; also electrical installations in connection with the erection of seven shops, seven maisonettes and seven garages at each of two sites. City architect, Town Hall.

**Newton Abbot.**—10th June. U.D.C. Electrical wiring and fittings for 60 houses on Buckland estate. C. Lunn, surveyor, 18, Devon Square.

**Sheffield.**—9th June. City Council. Electrical installations at 100 aged persons' flats, Manor Park estate, 16 aged persons' flats at Richmond estate, 44 terrace houses on Manor Park estate, and 41 terrace houses on Littledale estate. W. G. Davies, city architect, Town Hall.

**Windsor.**—9th June. R.D.C. Electrical work in connection with improvements to 30 houses at Sunningdale. Building surveyor, Bowden Road, Sunninghill.

12th June. Town Council. Electrical installations in 30 houses on Imperial Road site. Borough surveyor, Kipling Memorial Building.

## ORDERS PLACED

**London.**—L.C.C. Housing Committee. Electrical installations in 77 dwellings at East Greenwich Cottages (£1,715).—Electric Contracts (London), Ltd.

## CONTRACTS IN PROSPECT

*Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.*

**Acton.**—Five-bay garage, Central Depot, Wales Farm Road; borough surveyor, Town Hall, W.3.

**Blantyre.**—Ice-cream factory and cafe; Cullen, Lochhead & Brown, architects, 119, Cadzow Street, Hamilton.

**Bootle.**—Dwellings (70), site near Sterrix Lane, and dwellings (36), near Ford Station; borough surveyor, Town Hall.

**Burnley.**—Technical college, Eastern Avenue; Kitson Parish, Ledgard & Pyman, architects, Lloyds Bank Chambers, Vicar Lane, Leeds.

Research laboratory and administration block; Joseph Lucas, Ltd., Wood Top Works, Villiers Street.

**Burton-on-Trent.**—Mechanical services for new technical college; H. J. Knox, consulting engineer, 49, Ernest Grove, Beckenham.

**Cambridge.**—Houses (40), Ditton Lane site; borough surveyor.

**Chapel-en-le-Frith.**—Adaptation of "The Elms" as home for aged; C. E. Gaunt & Sons, Ltd., Chesterfield.

**Chatham.**—Factory, Princes Avenue; R. W. Overton, Ltd., Town Hall Chambers, Borough High Street, S.E.1.

**Cheadle (Staffs.).**—Houses for R.D.C.; L. Bates, Ltd., Bycars Lane, Burslem, Stoke-on-Trent (sixteen) and J. A. Bailey, Tape Street, Cheadle (six).

**Chelmsford.**—Joinery works, etc., Widford Hall Lane; F. Hodgson & Son, Friars Place.

**Cheshire.**—Schools at Altrincham, Sale, Crewe, Cuddington, Weaverham, Ellesmere Port and Bebington; county architect, The Castle, Chester.

**Chesterfield.**—Houses (92), eastern section of Newbold estate; borough engineer.

Engineering workshops; Sheepbridge Engineering, Ltd., Sheepbridge Works.

**Corby.**—Houses at Lodge estate (574 in first stage); borough surveyor.

**Essex.**—Two schools (£146,000 and £98,000), Dagenham and Debden; H. Conolly, county architect, County Hall, Chelmsford.

**Eston.**—Bungalows (38), South Bank, for the U.D.C.; G. H. Rogers, builders, Stockton Road, Middlesbrough.

**Halifax.**—New workshops and laboratory at technical college annexe, Lister Lane; borough surveyor, Crossley Street.

**Heanor.**—Houses for U.D.C.:— F. Sisson & Sons, Ltd., Cromford Road, Langley Mill (46) and J. Bullock & Son, Heanor (20).

**Helston.**—Reconstruction and extension of sewage disposal works; Ross Hooper and Harvey, engineers, 38, Market Place, Chippenham.

**Hendon.**—Factory extensions; Alfred Gilbert & Sons, Ltd., Edgware Road, The Hyde.

**Hertfordshire.**—Clarendon school, Oxhey (£194,115), Oxhey grammar school (£142,401), Stanstead Road school, Hoddesdon (£173,060), Shenley Lane school, London Colney (£63,176) and workshop block at North Herts technical school (£76,500); county architect, County Offices, Hertford.

**Holyhead.**—Seven blocks of flats at London Road No. 2 site; Jones & Lloyd, Kingsland Road.

**Ipswich.**—Primary school, Castle Hill; Johns & Slater, architects, 32, Foundation Street.

**Lancashire.**—Adaptations at Broad Oak children's home, Accrington (£11,462); county architect, County Offices, Preston.

**Leeds.**—Adaptation of Iveson House, Cockridge. (£14,461); Mark Haley & Sons, Ltd., Appleton Grove.

**Litherland.**—St. Bedes R.C. secondary school; A. Ellis, architect, Dale Street, Liverpool.

**Liverpool.**—Department of civic design at Liverpool University; Professor Gordon Stephenson, 49, Meols Drive, Hoylake.

**Llandudno.**—Fourteen blocks of three-storey houses at Trecreuddyn estate; J. A. Edwards, U.D.C. surveyor.

**London.**—Islington.—Block of 24 flats, Queen Margarets Grove; H. Monson, architect, 120, Moorgate, E.C.2.

**Middleton (Lancs.).**—Moorclose secondary school; J. Gerrard & Sons, Ltd., Swinton, Manchester.

**Newarthill.**—Forty-eight blocks of houses; Scottish Special Housing Association, Ltd., 15, Palmerston Place, Edinburgh.

**North Riding.**—Alterations to Brompton Hall, near Scarborough (£10,000); county architect, County Hall, Northallerton.

**North Shields.**—Extensions to transit shed at Tyne Commission Quay (£9,200); chief engineer, Tyne Commission, Bewick Street, Newcastle-on-Tyne.

**Northumberland.**—Police houses at Hexham, West Denton, Bedlington and Bamburgh; A. H. Davis, quantity surveyor, 107, New Bridge Street, Newcastle-on-Tyne.

New secondary modern school at Seaton Burn; Cackett, Burns Dick and McKellar, architects, 21, Ellison Place, Newcastle-on-Tyne.

**Nottingham.**—Secondary school, Padstow Road; city engineer.

**Peterborough.**—Flats (16), shops (14) and branch library, Central Avenue; F. J. Smith, city engineer, Town Hall.

**Plymouth.**—Four-storey building, new George Street and Old Town Street corner; Boots Pure Drug Co., Ltd., Station Street, Nottingham.

**Reigate.**—Houses (60), Dovers Green estate; Wates, Ltd., builders, 1258, London Road, S.W.16.

**Salford.**—Day nurseries at Bradshaw St., and Hayfield Terrace, Pendleton; S. Cookson & Son, Ltd., 1, Comus Street, Manchester.

**Shardlow.**—Houses (34), Blagreaves site, for U.D.C.; Pearman & Wade, 8, Autumn Grove, Chaddesden.

**Sheffield.**—Primary school, Greenhill; Hill & Roberts, Ltd.

Technical secondary school (£200,000), Jordanthorpe; city architect.

**Skipton.**—Houses (50), Horse Close estate, for U.D.C.; J. Newsome Walker, Horsforth.

**Solihull.**—Cinema, Station Road; H. W. Weedon & Partners, architects, 129, Lordswood Road, Birmingham.

**Southampton.**—Junior school, Wimpson; Lyons & Israel, architects, 26, Seymour Street, W.1.

**Southport.**—Houses (60), Heathfield Road site; borough engineer.

**South Shields.**—Houses (60), Simonside; borough engineer.

**Sutton Coldfield.**—Houses (36), Clarence Road; Yenton Building Co. (1938), Ltd., 52, Gravelly Hill Road North, Birmingham.

**Swansea.**—Houses (136), section three of Gendros estate; Geo. Wimpey & Co., Ltd., builders, 27, Hammersmith Grove, W.6.

**Wakefield.**—Extensions to training school for defectives, Bishopgarth; county architect, County Hall, Wakefield.

**Wallasey.**—Hostel for aged persons, Moreton; borough architect.

**Watford.**—Houses 26 and 12 flats, Woodside estate; C. & A. Catchpole, Ltd., builders, Leighton House, Darkes Lane, Potters Bar.

**West Bridgford (Notts).**—New county hall; E. Vincent Harris, architect, 19, West Eaton Place, London, S.W.1.

**Whitehaven.**—Houses, Valley estate; borough surveyor.

**Wigan.**—Erection of Pemberton primary school; Unit Construction Co., Ltd., Knutsford.

**Winslow.**—Aged persons' hostel (£18,000) for Bucks. C.C.; county architect, County Hall, Aylesbury.

**Worcester.**—Police houses for C.C.; J. Taylor & Son, Ltd., Lye.

## TRADE MARKS

APPLICATIONS have been made for the registration of the following trade marks. Objections may be entered within a month of 24th May.

No. 680,610 (design). Class 9. Electric cables and connectors therefor, and thermocouples being temperature testing apparatus.—Avica Equipment, Ltd., 50, Pall Mall, London, S.W.1.

Sartorius. No. B682,622. Class 9. Electrical apparatus and instruments included in Class 9, and photographic, optical, weighing, measuring and signalling apparatus and instruments.—Sartorius-Werke Aktiengesellschaft, Göttingen, Germany.—Address for service c/o W. P. Thompson & Co., 50, Lincoln's Inn Fields, London, W.C.2.

Filpar. No. 686,238. Class 9. Electrical apparatus and instruments included in Class 9.—R. Cuchet, Nancy, France. Address for service c/o Mewburn, Ellis & Co., 70 and 72, Chancery Lane, London, W.C.2.

Lido-Solet. No. 687,532. Class 10. Electric sun-ray lamps.—Tellux, Ltd., 17-19, Edge Street, London, W.8.